27. UNDERWAY GEOPHYSICAL OBSERVATIONS, LEG 36 DEEP SEA DRILLING PROJECT

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INTRODUCTION

Leg 36 of the Deep Sea Drilling Project started from Ushuaia (Argentina) on 4 April and finished in Rio de Janeiro (Brazil) on 22 May 1974, having drilled 10 holes at six sites and steamed 4445 nautical miles (n.mi.). Two additional stops were made, at Bahia Aguirre (Argentina) and at a Vema Channel site which was never drilled, and very bad weather occasionally prevented the safe towing of gear astern. Otherwise, magnetic, bathymetric, and seismic reflection data were acquired continuously on passage. The ship's track is shown on Figure 1, an expanded version of which will be found at the back of this volume.

Navigation was by satellite receiver, pit-log, and gyrocompass and data were reduced and collated by the Scripps shipboard technical staff. The navigational data upon which the track in Figure 1 is based are listed in Table 1. Successive columns in the table display date, time, position, actual and intended speed and course, and the nature of the navigational information on a particular line (fix, course, or speed change) with, for satellite fixes, an index of quality which has a higher value for a better fix. The fix quality index is omitted for fixes after Site 331; these fixes had to be computed at DSDP after the cruise because of a shipboard computer breakdown.

The table includes such site survey tracks as were made; Figure 1 is inadequate for displaying site survey tracks, but a more expanded track chart forms part of the account of findings at each site (see Chapters 2 to 7, this volume), as necessary.

Bathymetric data were obtained by means of a Gifft precision depth recorder with a 12-kHz transducer, and magnetic measurements with a Varian total-field proton precession magnetometer. Depths are based upon a one-way sound velocity of 800 fathoms (1463 m) per second and are not corrected for actual variations of the speed of sound in seawater. Values of magnetic field and water depth at 5-min intervals are plotted against distance along the ship's track in Figures 2 to 17. The International Geomagnetic Reference Field (IAGA, 1969) has been removed from the magnetic values. The profiles were plotted on a Mercator Scale of 1:1.5 million at 57°S before photographic reduction, which was the same for each profile and amounts to about 1.9 to 1. A standard 100-km line on each figure gives an approximate indication of scale. Vertical exaggeration on the profiles varies from 20:1 at 57°S to 34:1 at 24°S. Sea level is at the top of each figure and horizontal lines at either side are at 1000-meter intervals. These lines also mark 100 nT intervals and the zero magnetic anomaly line lies at 4000 meters. Time is marked every 4 hr to ease comparison with the reflection profiles. Arrows directly above the baseline show the ship's course between the times marked by the short vertical lines.

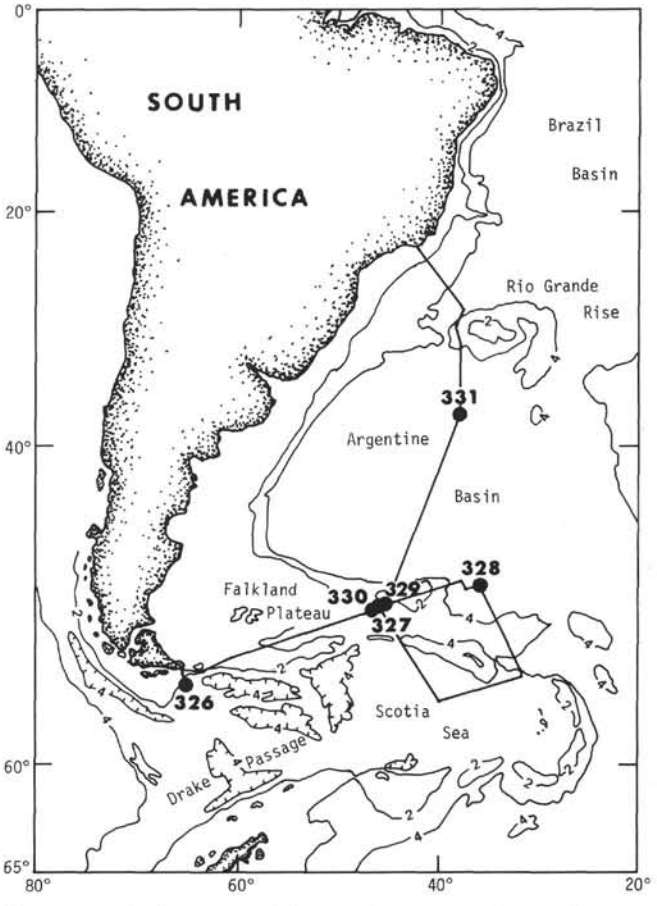

Figure 1. *Bathymetry of the southwestern Atlantic Ocean basin and location of Leg 36 sites.*

The reflection profiler sound source usually comprised two Bolt PAR 600A airguns, of chamber size 10 and 40 in.^{3}, charged to 2000 psi and fired every 10 sec. The reflected energy arriving at two Scripps-made hydrophone arrays was added and bandpass-filtered, almost always between 160 and 320 Hz, before display on two EDO Western variable-density recorders, of sweep speeds 4 and 10 sec. This rather high pass-band is entirely above the peak frequencies of the output power spectra of the guns, but is forced upon the shipboard party by the large amounts of ship-generated noise at lower frequencies; the result is good resolution but relatively poor penetration. The 10-sec profiler record is displayed with the magnetic and bathymetric profiles (and reversed left to right for compatibility) in Figures 2 to 17. Marks at 4-hr intervals on the reflection profile

TABLE 1
Navigational Data

Da.	Date Mo.	Yr.	Time	Deg.	Min.	Deg.	Min.	Dist.	Speed	CSE	Speed	CSE	CMNT	QLTY
04	04	1974	2048	-55	27.3	-65	52.0	0.0	3.3	158	4.0	156		0.00
04	04	1974	2049	-55	27.4	-65	52.0	0.1	9.2	157	9.9	156	C/S	–
04	04	1974	2112	-55	30.6	-65	49.5	3.6	9.5	151	9.9	156	SATL	1.00
04	04	1974	2340	-55	51.1	-65	29.2	27.1	9.3	167	9.9	171	C/C	–
04	04	1974	2350	-55	52.6	-65	28.6	28.6	8.9	160	9.9	171	SATL	0.50
05	04	1974	0000	-55	54.0	-65	27.7	30.1	8.9	142	9.9	171	SATL	1.00
05	04	1974	0130	-56	5.8	-65	16.4	43.7	8.3	154	9.9	183	C/C	–
05	04	1974	200	-56	9.6	-65	13.1	47.8	6.7	146	8.0	183	C/S	–
05	04	1974	0400	-56	20.6	-64	59.6	61.2	3.2	228	8.0	235	C/C	–
05	04	1974	0415	-56	21.2	-65	0.7	62.0	2.7	227	7.5	235	C/S	–
05	04	1974	0712	-56	26.6	-65	11.2	70.0	2.5	208	7.5	235	SATL	1.00
05	04	1974	0816	-56	29.0	-65	13.5	72.7	2.7	217	7.5	235	SATL	1.50
05	04	1974	0900	-56	30.6	-65	15.7	74.7	3.3	227	7.5	235	SATL	0.50
05	04	1974	0930	-56	31.7	-65	17.9	76.3	3.4	216	7.5	230	C/C	–
05	04	1974	1002	-56	33.2	-65	19.8	78.2	4.6	223	7.5	230	SATL	1.00
05	04	1974	1045	-56	35.6	-65	23.9	81.5	5.0	200	7.5	215	C/C	–
05	04	1974	1046	-56	35.7	-65	24.0	81.6	4.7	204	7.5	215	SATL	0.25
05	04	1974	1100	-56	36.7	-65	24.8	82.7	5.1	189	7.5	205	C/C	–
05	04	1974	1236	-56	44.7	-65	27.1	90.8	5.5	200	7.5	205	SATL	1.00
05	04	1974	1342	-56	50.4	-65	30.9	96.8	5.2	202	7.5	205	SATL	1.00
05	04	1974	1410	-56	52.6	-65	32.5	99.2	7.9	103	7.5	120	C/C	–
05	04	1974	1422	-56	53.0	-65	29.7	100.8	7.9	119	7.5	120	SATL	1.00
05	04	1974	1436	-56	53.9	-65	26.7	102.7	7.4	6	7.5	3	C/C	–
05	04	1974	1528	-56	47.5	-65	25.4	109.1	8.0	6	7.5	3	SATL	1.50
05	04	1974	1612	-56	41.7	-65	24.2	115.0	7.3	358	7.5	3	SATL	0.25
05	04	1974	1628	-56	39.8	-65	24.3	116.9	6.9	53	7.5	55	C/C	–
05	04	1974	1645	-56	38.6	-65	21.5	118.9	7.0	22	7.5	26	C/	–
05	04	1974	1656	-56	37.4	-65	20.6	120.1	8.5	28	7.5	26	SATL	1.00
05	04	1974	1716	-56	34.9	-65	18.2	123.0	7.6	27	7.5	26	S326	1.50
06	04	1974	2325	-56	34.9	-65	6.5	129.4	9.0	326	9.1	325	U/W	–
06	04	1974	2354	-56	31.3	-65	10.9	133.8	5.6	352	9.1	325	SATL	0.50
07	04	1974	0000	-56	30.7	-65	11.0	134.3	5.6	352	9.1	325		–
07	04	1974	0022	-56	28.7	-65	11.6	136.4	6.1	351	9.1	325	SATL	0.25
07	04	1974	0100	-56	24.9	-65	12.7	140.2	6.0	345	9.1	325	SATL	0.25
07	04	1974	0220	-56	17.2	-65	16.6	148.2	5.2	313	9.1	305	C/C	–
07	04	1974	0242	-56	15.9	-65	19.1	150.1	4.9	324	9.1	305	SATL	1.50
07	04	1974	0334	-56	12.5	-65	23.6	154.4	5.6	314	9.1	305	SATL	0.25
07	04	1974	0416	-56	9.8	-65	28.7	158.3	6.0	329	9.1	315	C/C	–
07	04	1974	0432	-56	8.4	-65	30.2	159.9	5.5	317	9.1	315	SATL	1.00
07	04	1974	0524	-56	4.9	-65	36.0	164.7	7.8	317	9.1	315	SATL	0.00
07	04	1974	0600	-56	1.5	-65	41.7	169.4	8.1	343	9.1	337	C/C	–
07	04	1974	0616	-55	59.4	-65	42.8	171.5	7.9	346	9.1	337	SATL	0.50
07	04	1974	0722	-55	51.0	-65	46.4	180.1	8.1	346	9.1	337	SATL	1.00
07	04	1974	0800	-55	46.0	-65	48.6	185.2	7.6	320	9.1	315	C/C	–
07	04	1974	0824	-55	43.7	-65	52.1	188.3	9.6	322	9.1	315	SATL	1.00
07	04	1974	0908	-55	38.2	-65	59.8	195.3	9.1	322	9.1	315	SATL	0.50
07	04	1974	0943	-55	34.0	-66	5.5	200.6	9.3	332	9.1	325	C/C	–
07	04	1974	1010	-55	30.3	-66	9.0	204.8	9.5	327	9.1	325	SATL	1.00
07	04	1974	1030	-55	27.6	-66	12.0	208.0	0.5	13	0.0	500	STOP	–
10	04	1974	0000	-54	54.9	-65	58.6	241.5	9.3	132	9.6	135	U/W	–
10	04	1974	0036	-54	58.7	-65	51.2	247.2	11.4	128	9.6	135	DEP	0.50
10	04	1974	0104	-55	1.9	-65	43.9	252.5	11.8	91	9.6	90	C/C	–
10	04	1974	0204	-55	2.1	-65	23.2	264.4	12.1	86	9.6	90	SATL	0.00
10	04	1974	0402	-55	0.5	-64	41.8	288.2	12.2	80	9.6	82	C/C	–
10	04	1974	0532	-54	57.8	-64	6.2	308.7	12.8	77	9.6	82	SATL	1.50
10	04	1974	0620	-54	55.5	-63	48.8	319.0	13.0	66	9.6	67	C/CS	–
10	04	1974	0745	-54	47.9	-63	19.3	337.6	12.7	57	9.6	67	SATL	0.00
10	04	1974	0902	-54	39.2	-62	55.8	353.7	11.9	56	9.6	67	SATL	0.50
10	04	1974	0920	-54	37.2	-62	50.7	357.3	11.6	63	9.6	75	C/C	–
10	04	1974	1014	-54	32.4	-62	34.7	367.7	10.8	67	9.6	75	SATL	0.25
10	04	1974	1208	-54	24.3	-62	2.3	388.2	10.3	62	9.6	75	SATL	1.50
10	04	1974	1354	-54	15.7	-61	34.9	406.4	9.3	68	9.6	75	SATL	1.50
10	04	1974	1440	-54	13.1	-61	23.6	413.5	9.2	72	9.6	79	C/C	–
10	04	1974	1542	-54	10.2	-61	8.1	423.0	9.6	83	9.6	79	SATL	0.50
10	04	1974	1808	-54	7.2	-60	28.7	446.3	10.8	80	9.6	79	SATL	0.50
10	04	1974	1900	-54	5.6	-60	13.0	455.6	10.8	71	9.6	69	C/C	–
10	04	1974	2140	-53	56.2	-59	26.7	484.4	10.5	67	9.6	69	SATL	1.50

TABLE 1 – *Continued*

Da.	Date Mo.	Yr.	Time	Deg.	Min.	Deg.	Min.	Dist.	Speed	CSE	Speed	CSE	CMNT	QLTY
10	04	1974	2230	-53	52.8	-59	13.0	493.1	9.7	65	9.6	69	SATL	0.00
10	04	1974	2326	-53	49.0	-58	59.1	502.2	10.4	65	9.6	69	SATL	1.50
11	04	1974	0000	-53	46.5	-58	50.1	508.1	10.4	61	9.6	65	C/C	–
11	04	1974	0014	-53	45.3	-58	46.5	510.5	9.7	61	9.6	65	SATL	1.50
11	04	1974	0234	-53	34.2	-58	13.2	533.1	10.5	61	9.6	65	SATL	1.50
11	04	1974	0324	-53	29.9	-58	0.3	541.9	10.4	68	9.6	73	C/C	–
11	04	1974	0352	-53	28.1	-57	52.7	546.8	10.2	79	9.6	73	SATL	1.00
11	04	1974	440	-53	26.6	-57	39.2	555.0	9.5	73	9.6	73	SATL	1.50
11	04	1974	0512	-53	25.1	-57	31.1	560.0	10.8	74	9.6	73	SATL	1.00
11	04	1974	530	-53	24.2	-57	25.9	563.3	10.7	65	9.6	63	C/C	–
11	04	1974	658	-53	17.6	-57	1.9	579.0	8.5	60	9.6	63	SATL	0.25
11	04	1974	0730	-53	15.3	-56	55.4	583.5	8.4	63	9.6	66	C/C	–
11	04	1974	738	-53	14.8	-56	53.7	584.7	10.6	66	9.6	66	SATL	1.50
11	04	1974	844	-53	10.0	-56	36.0	596.3	11.0	63	9.6	66	SATL	1.50
11	04	1974	915	-53	7.4	-56	27.6	602.0	11.0	65	9.6	69	C/C	–
11	04	1974	938	-53	5.6	-56	21.2	606.2	10.1	66	9.6	69	SATL	1.00
11	04	1974	1112	-52	59.1	-55	57.3	622.0	9.9	66	9.6	69	SATL	1.00
11	04	1974	1304	-52	51.6	-55	29.3	640.5	9.3	69	9.6	69	SATL	1.00
11	04	1974	1354	-52	48.8	-55	17.4	648.2	9.1	60	9.6	69	SATL	0.50
11	04	1974	1440	-52	45.3	-55	7.4	655.2	9.1	62	9.6	71	C/C	–
11	04	1974	1452	-52	44.4	-55	4.8	657.0	8.0	71	9.6	71	SATL	1.00
11	04	1974	1542	-52	42.2	-54	54.4	663.7	8.3	71	9.6	71	SATL	0.50
11	04	1974	1708	-52	38.3	-54	35.8	675.6	8.8	76	9.6	71	SATL	0.25
11	04	1974	1946	-52	32.6	-53	58.7	698.8	8.6	75	9.6	71	SATL	1.50
11	04	1974	2030	-52	30.9	-53	48.7	705.2	8.6	67	9.6	64	C/C	–
11	04	1974	2054	-52	29.6	-53	43.5	708.6	8.3	66	9.6	64	SATL	1.50
11	04	1974	2134	-52	27.4	-53	35.2	714.1	8.9	68	9.6	64	SATL	1.50
11	04	1974	2324	-52	21.4	-53	10.4	730.4	9.1	69	9.6	64	SATL	0.00
12	04	1974	0000	-52	19.4	-53	2.1	735.8	9.1	69	9.6	64		–
12	04	1974	0006	-52	19.1	-53	0.7	736.7	9.8	65	9.6	64	SATL	0.25
12	04	1974	0118	-52	14.1	-52	43.3	748.5	9.6	63	9.6	64	SATL	0.50
12	04	1974	0140	-52	12.5	-52	38.2	752.0	10.1	63	9.6	64	SATL	0.50
12	04	1974	0202	-52	10.8	-52	32.8	755.7	9.8	61	9.6	64	SATL	0.50
12	04	1974	0300	-52	6.2	-52	19.2	765.2	9.8	67	9.6	70	C/C	–
12	04	1974	326	-52	4.6	-52	12.8	769.5	10.2	68	9.6	70	SATL	0.50
12	04	1974	422	-52	1.0	-51	58.4	779.1	9.9	70	9.6	70	SATL	0.50
12	04	1974	0514	-51	58.0	-51	45.3	787.7	10.3	67	9.6	70	SATL	0.25
12	04	1974	0530	-51	56.9	-51	41.2	790.4	10.3	68	9.6	71	C/C	–
12	04	1974	0610	-51	54.3	-51	30.9	797.3	9.8	72	9.6	71	SATL	1.00
12	04	1974	0756	-51	48.9	-51	4.4	814.5	10.1	70	9.6	71	SATL	1.50
12	04	1974	0834	-51	46.7	-50	54.7	820.9	9.7	72	9.6	71	SATL	1.00
12	04	1974	0944	-51	43.2	-50	37.4	832.2	9.9	71	9.6	71	SATL	0.00
12	04	1974	1026	-51	40.9	-50	26.9	839.1	9.5	68	9.6	71	SATL	1.00
12	04	1974	1302	-51	31.7	-49	50.0	863.8	9.5	66	9.6	71	SATL	1.00
12	04	1974	1404	-51	27.8	-49	35.6	873.5	9.7	68	9.6	71	SATL	1.00
12	04	1974	1410	-51	27.4	-49	34.2	874.5	9.4	71	9.3	74	C/C	–
12	04	1974	1450	-51	25.4	-49	24.7	880.7	10.1	72	9.3	74	SATL	1.00
12	04	1974	1614	-51	21.1	-49	3.2	894.8	10.1	72	9.3	74	SATL	1.00
12	04	1974	1620	-51	20.8	-49	1.7	895.8	5.9	71	5.1	74	C/S	–
12	04	1974	1638	-51	20.2	-48	59.0	897.6	10.4	72	9.6	74	C/S	–
12	04	1974	1816	-51	15.0	-48	33.1	914.6	10.5	71	9.6	74	SATL	1.50
12	04	1974	2004	-51	8.8	-48	4.7	933.5	11.2	72	9.6	74	SATL	1.50
12	04	1974	2112	-51	4.8	-47	45.5	946.2	9.6	70	9.6	74	SATL	1.50
12	04	1974	2206	-51	1.9	-47	32.5	954.8	9.6	72	9.6	76	C/C	–
12	04	1974	2234	-51	0.5	-47	25.7	959.3	10.2	72	9.6	76	SATL	0.50
12	04	1974	2245	-50	59.9	-47	22.9	961.2	9.8	103	9.6	108	C/C	–
12	04	1974	2312	-51	0.9	-47	16.0	965.6	6.3	100	6.1	108	C/S	–
12	04	1974	2315	-51	0.9	-47	15.5	965.9	4.5	96	4.3	108	C/S	–
12	04	1974	2352	-51	1.2	-47	11.1	968.7	9.8	103	9.6	108	C/S	–
13	04	1974	0000	-51	1.5	-47	9.1	970.1	9.8	103	9.6	108	C/C	–
13	04	1974	0022	-51	2.3	-47	3.5	973.6	9.9	101	9.6	108	SATL	0.50
13	04	1974	0110	-51	3.8	-46	51.1	981.6	9.3	106	9.6	108	SATL	1.50
13	04	1974	0142	-51	5.2	-46	43.6	986.5	5.5	352	5.1	354	C/S	–
13	04	1974	0148	-51	4.6	-46	43.7	987.1	6.5	352	6.1	354	C/S	–
13	04	1974	0154	-51	4.0	-46	43.8	987.7	7.0	352	6.6	354	C/S	–
13	04	1974	0230	-50	59.8	-46	44.7	991.9	5.4	8	6.6	354	SATL	1.50
13	04	1974	0256	-50	57.5	-47	44.2	994.3	5.4	359	6.6	354	SATL	1.50
13	04	1974	0334	-50	54.1	-46	44.3	997.7	5.8	352	6.6	354	SATL	1.00

TABLE 1 – *Continued*

Da.	Date Mo.	Yr.	Time	Deg.	Min.	Deg.	Min.	Dist.	Speed	CSE	Speed	CSE	CMNT	QLTY
13	04	1974	0416	-50	50.1	-46	45.2	1001.7	5.8	0	6.6	354	SATL	0.50
13	04	1974	0444	-50	47.4	-46	45.2	1004.4	6.0	358	6.6	354	SATL	0.25
13	04	1974	0522	-50	43.6	-46	45.4	1008.2	5.9	355	6.6	354	SATL	1.00
13	04	1974	0604	-50	39.5	-46	46.0	1012.3	7.9	2	6.6	354	SATL	0.50
13	04	1974	0636	-50	35.3	-46	45.8	1016.5	5.1	183	6.6	190	C/C	–
13	04	1974	0708	-50	38.0	-46	46.0	1019.3	5.1	186	6.6	190	SATL	1.50
13	04	1974	0748	-50	41.4	-46	46.6	1022.7	4.8	183	6.6	190	SATL	1.50
13	04	1974	0858	-50	47.0	-46	47.1	1028.3	5.1	179	6.6	190	SATL	0.50
13	04	1974	0938	-50	50.4	-46	47.0	1031.7	5.8	189	6.6	190	SATL	0.50
13	04	1974	0958	-50	52.3	-46	47.5	1033.6	6.6	190	6.6	190	S327	1.50
17	04	1974	2135	-50	52.8	-46	47.0	1034.2	1.3	39	0.0	500	DEP	1.50
17	04	1974	2135	-50	52.8	-46	47.0	1034.2	9.7	120	9.6	127	U/W	–
17	04	1974	2200	-50	54.8	-46	41.4	1038.3	10.2	124	9.6	127	SATL	1.00
17	04	1974	2239	-50	58.5	-46	32.6	1044.9	10.2	127	9.6	130	C/C	–
17	04	1974	2240	-50	58.6	-46	32.4	1045.1	10.4	127	9.6	130	SATL	1.50
17	04	1974	2344	-51	5.3	-46	18.4	1056.2	10.3	126	9.6	130	SATL	0.25
18	04	1974	0000	-51	6.9	-46	14.9	1058.9	10.3	126	9.6	130		–
18	04	1974	0026	-51	9.5	-46	9.1	1063.4	10.1	125	9.6	130	SATL	1.00
18	04	1974	0126	-51	15.3	-45	55.9	1073.5	10.2	124	9.6	130	SATL	1.50
18	04	1974	0245	-51	22.9	-45	38.2	1086.9	9.8	148	9.6	155	C/C	–
18	04	1974	0308	-51	26.1	-45	35.0	1090.7	10.0	150	9.6	155	SATL	1.00
18	04	1974	0452	-51	41.0	-45	21.0	1107.9	9.3	148	9.6	155	SATL	1.00
18	04	1974	0532	-51	46.3	-45	15.7	1114.2	9.3	145	9.6	155	SATL	0.50
18	04	1974	0640	-51	55.0	-45	6.0	1124.7	7.9	150	9.6	155	SATL	0.50
18	04	1974	0708	-51	58.2	-45	3.0	1128.4	8.0	145	9.6	155	SATL	0.50
18	04	1974	0745	-52	2.2	-44	58.4	1133.3	7.7	157	9.6	165	C/C	–
18	04	1974	0854	-52	10.4	-44	52.8	1142.2	8.0	160	9.6	165	SATL	1.50
18	04	1974	1040	-52	23.6	-44	44.9	1156.3	8.0	158	9.6	165	SATL	0.50
18	04	1974	1128	-52	29.5	-44	41.0	1162.6	8.6	160	9.6	165	SATL	1.00
18	04	1974	1230	-52	37.8	-44	36.0	1171.5	8.4	157	9.6	165	SATL	1.00
18	04	1974	1318	-52	44.0	-44	31.7	1178.2	8.3	158	9.6	165	SATL	1.00
18	04	1974	1330	-52	45.5	-44	30.7	1179.9	8.4	151	9.6	159	C/C	–
18	04	1974	1700	-53	11.4	-44	7.1	1209.4	8.1	156	9.6	1.59	SATL	0.50
18	04	1974	1740	-53	16.3	-44	3.4	1214.7	8.7	152	9.6	159	SATL	0.25
18	04	1974	1848	-53	25.0	-43	55.6	1224.6	8.4	154	9.6	159	SATL	1.00
18	04	1974	1925	-53	29.7	-43	51.8	1229.8	4.4	149	5.6	159	C/S	–
18	04	1974	1933	-53	30.2	-43	51.2	1230.4	8.4	154	9.6	159	C/S	–
18	04	1974	2112	-53	42.6	-43	40.9	1244.2	8.7	152	9.6	159	SATL	1.00
18	04	1974	2252	-53	55.4	-43	29.3	1258.8	9.1	152	9.6	159	SATL	0.00
18	04	1974	2336	-54	1.3	-43	24.0	1265.4	9.7	153	9.6	159	SATL	1.00
19	04	1974	0000	-54	4.8	-43	21.0	1269.3	9.7	153	9.6	159		–
19	04	1974	0032	-54	9.4	-43	17.0	1274.5	9.8	151	9.6	159	SATL	1.50
19	04	1974	0120	-54	16.3	-43	10.5	1282.4	9.9	153	9.6	159	SATL	1.50
19	04	1974	0218	-54	24.8	-43	3.0	1291.9	9.7	153	9.6	159	SATL	1.50
19	04	1974	0308	-54	32.0	-42	56.6	1300.1	9.9	151	9.6	159	SATL	1.50
19	04	1974	0408	-54	40.6	-42	48.2	1309.9	10.0	150	9.6	159	SATL	1.00
19	04	1974	0550	-54	55.3	-42	33.6	1326.9	10.0	148	9.6	159	SATL	1.00
19	04	1974	0622	-54	59.8	-42	28.6	1332.2	10.4	137	9.6	147	C/C	–
19	04	1974	0628	-55	0.6	-42	27.4	1333.3	10.2	138	9.6	147	SATL	1.00
19	04	1974	0746	-55	10.5	-42	11.9	1346.6	9.8	138	9.6	147	SATL	1.50
19	04	1974	0934	-55	23.6	-41	51.3	1364.1	9.2	131	9.6	147	SATL	1.00
19	04	1974	1015	-55	27.7	-41	43.0	1370.4	9.1	133	9.6	149	C/C	–
19	04	1974	1105	-55	32.9	-41	33.3	1378.0	8.7	133	9.2	149	C/S	–
19	04	1974	1320	-55	46.2	-41	7.8	1397.5	8.6	140	9.2	149	SATL	1.50
19	04	1974	1351	-55	49.6	-41	2.7	1402.0	9.0	141	9.6	149	C/S	–
19	04	1974	1402	-55	59.9	-41	0.9	1403.7	8.9	147	9.6	155	C/C	–
19	04	1974	1410	-55	51.9	-40	59.7	1404.8	9.0	149	9.6	155	SATL	1.00
19	04	1974	1504	-55	58.8	-40	52.2	1412.9	9.1	146	9.6	155	SATL	1.50
19	04	1974	1800	-56	20.8	-40	25.3	1439.5	6.9	148	9.6	155	SATL	1.00
19	04	1974	1835	-56	24.2	-40	21.5	1443.6	2.4	136	5.0	155	C/S	–
19	04	1974	1950	-56	26.4	-40	17.7	1446.6	2.5	88	5.0	155	SATL	0.50
19	04	1974	2000	-56	26.4	-40	16.9	1447.0	2.1	93	5.0	160	C/C	–
19	04	1974	2216	-56	26.6	-40	8.3	1451.8	1.3	129	5.0	160	SATL	1.00
19	04	1974	2246	-56	27.0	-40	7.4	1452.4	2.2	5.0	5.0	160	SATL	1.00
19	04	1974	2340	-56	28.0	-40	4.4	1454.4	2.9	126	5.0	160	SATL	0.50
20	04	1974	0000	-56	28.6	-40	3.0	1455.3	2.9	126	5.0	160		–
20	04	1974	0300	-56	33.6	-39	50.4	1463.9	2.4	143	5.0	170	C/C	–
20	04	1974	0305	-56	33.8	-39	50.2	1464.1	2.2	152	5.0	175	C/C	–
20	04	1974	0310	-56	33.9	-39	50.1	1464.3	2.1	163	5.0	180	C/C	–

TABLE 1 – *Continued*

Da.	Date Mo.	Yr.	Time	Deg.	Min.	Deg.	Min.	Dist.	Speed	CSE	Speed	CSE	CMNT	QLTY
20	04	1974	0318	-56	34.2	-39	49.9	1464.6	2.9	134	5.0	180	SATL	1.00
20	04	1974	0500	-56	34.7	-39	43.3	1469.6	2.6	140	5.0	185	C/C	–
20	04	1974	0534	-56	38.8	-39	41.6	1471.0	2.9	111	5.0	185	SATL	1.50
20	04	1974	0550	-56	39.1	-39	40.3	1471.8	2.5	113	5.0	190	C/C	–
20	04	1974	0555	-56	39.2	-39	39.9	1472.0	2.1	116	5.0	195	C/C	–
20	04	1974	0610	-56	39.4	-39	39.0	1472.6	1.7	118	5.0	200	C/C	–
20	04	1974	0630	-56	39.7	-39	38.2	1473.1	1.2	120	5.0	205	C/C	–
20	04	1974	0915	-56	41.3	-39	32.7	1476.5	9.9	49	5.0	60	C/C	–
20	04	1974	1224	-56	21.1	-38	49.4	1507.9	8.8	52	5.0	60	SATL	0.25
20	04	1974	1316	-56	16.4	-38	38.6	1515.5	9.4	62	5.0	60	SATL	0.00
20	04	1974	1400	-56	13.2	-38	27.7	1522.3	12.5	68	8.1	70	C/C	–
20	04	1974	1410	-56	12.4	-38	24.2	1524.4	8.9	65	8.1	70	SATL	0.25
20	04	1974	1504	-56	9.0	-38	11.2	1532.4	8.5	68	8.1	70	SATL	0.25
20	04	1974	1655	-56	3.1	-37	45.1	1548.1	8.5	73	8.1	75	C/C	–
20	04	1974	1858	-55	57.9	-37	15.5	1565.5	8.6	69	8.1	75	SATL	1.50
20	04	1974	2104	-55	51.4	-36	45.4	1583.6	8.8	70	8.1	75	SATL	1.00
20	04	1974	2215	-55	47.8	-36	28.1	1593.9	7.3	69	6.6	75	C/S	–
20	04	1974	2316	-55	45.1	-36	15.8	1601.3	7.6	72	6.6	75	SATL	0.50
20	04	1974	2342	-55	44.1	-36	10.2	1604.7	8.5	72	6.6	75	SATL	0.50
20	04	1974	2358	-55	43.4	-36	6.4	1606.9	7.5	72	5.6	75	C/S	–
21	04	1974	0000	-55	43.3	-36	5.9	1607.2	7.5	72	5.6	75		–
21	04	1974	0028	-55	42.2	-36	0.0	1610.7	6.6	65	5.6	75	SATL	1.50
21	04	1974	0102	-55	40.6	-35	54.0	1614.4	6.6	68	5.6	75	SATL	1.50
21	04	1974	0124	-55	39.7	-35	50.0	1616.9	7.5	70	5.6	75	SATL	1.50
21	04	1974	0216	-55	37.5	-35	39.1	1623.4	7.1	67	5.6	75	SATL	0.50
21	04	1974	0412	-55	32.2	-35	16.8	1637.1	7.4	67	5.6	75	SATL	1.50
21	04	1974	0536	-55	28.1	-35	0.0	1647.4	7.1	65	5.6	75	SATL	0.25
21	04	1974	0620	-55	25.9	-34	51.7	1652.6	7.0	67	5.6	77	SATL	1.50
21	04	1974	0634	-55	25.3	-34	49.0	1654.3	7.3	67	5.6	77	SATL	1.50
21	04	1974	0746	-55	21.9	-34	34.7	1663.1	6.8	62	5.6	77	SATL	0.50
21	04	1974	0820	-55	20.1	-34	28.7	1666.9	7.1	66	5.6	77	SATL	1.00
21	04	1974	0906	-55	17.9	-34	19.9	1672.4	6.5	60	5.6	77	SATL	0.50
21	04	1974	1000	-55	15.0	-34	11.0	1678.3	9.4	50	8.1	60	C/CS	–
21	04	1974	1016	-55	13.4	-34	7.6	1680.8	9.5	54	8.1	60	SATL	0.50
21	04	1974	1030	-55	12.1	-34	4.4	1683.0	7.1	52	5.6	60	C/S	–
21	04	1974	1103	-55	9.7	-33	59.1	1686.9	9.5	54	8.1	60	C/S	–
21	04	1974	1112	-55	8.8	-33	57.1	1688.3	8.5	53	7.1	60	C/S	–
21	04	1974	1224	-55	2.7	-33	42.7	1698.6	8.0	48	7.1	60	SATL	1.50
21	04	1974	1316	-54	58.1	-33	33.7	1705.5	7.6	50	7.1	60	SATL	0.50
21	04	1974	1412	-54	53.6	-33	24.2	1712.6	7.1	52	7.1	60	SATL	0.50
21	04	1974	1504	-54	49.8	-33	15.7	1718.8	8.0	58	7.1	60	SATL	0.50
21	04	1974	1702	-54	41.4	-32	52.6	1734.5	7.2	57	7.1	60	SATL	0.25
21	04	1974	1805	-54	37.3	-32	41.7	1742.1	9.2	58	9.1	60	C/S	–
21	04	1974	1812	-54	36.7	-32	40.1	1743.1	11.0	63	9.1	60	SATL	0.50
21	04	1974	1918	-54	31.3	-32	21.5	1755.2	9.0	64	7.1	60	C/S	–
21	04	1974	1930	-54	30.5	-32	18.7	1757.0	6.8	286	8.6	280	C/CS	–
21	04	1974	2025	-54	28.8	-32	29.0	1763.3	9.2	12	8.6	0	C/C	–
21	04	1974	2030	-54	28.0	-32	28.7	1764.0	8.1	1	8.6	0	SATL	1.50
21	04	1974	2115	-54	21.9	-32	28.5	1770.1	5.1	2	5.6	0	C/CS	–
21	04	1974	2248	-54	14.0	-32	28.1	1778.0	5.9	11	5.6	0	SATL	0.50
21	04	1974	2336	-54	9.4	-32	26.6	1782.7	6.4	345	5.6	0	SATL	0.25
22	04	1974	0000	-54	6.9	-32	27.7	1785.3	6.4	345	5.6	0		–
22	04	1974	0012	-54	5.7	-32	28.3	1786.5	5.5	14	5.6	0	SATL	1.00
22	04	1974	0058	-54	1.6	-32	26.6	1790.8	5.9	28	5.6	15	C/C	–
22	04	1974	0105	-54	1.0	-32	26.0	1791.5	4.3	33	4.0	15	C/S	–
22	04	1974	0124	-53	59.8	-32	24.8	1792.8	3.2	342	4.0	325	C/C	–
22	04	1974	0222	-53	56.9	-32	26.4	1795.9	3.3	341	4.0	325	SATL	1.00
22	04	1974	0255	-53	55.2	-32	27.4	1797.7	2.8	295	4.0	290	C/CS	–
22	04	1974	0310	-53	54.9	-32	28.5	1798.4	2.9	322	4.0	290	SATL	1.00
22	04	1974	0350	-53	53.4	-32	30.5	1800.3	2.5	309	4.0	280	C/C	–
22	04	1974	0412	-53	52.8	-32	31.7	1801.3	2.6	280	4.0	280	SATL	1.00
22	04	1974	0600	-53	51.9	-32	39.7	1806.0	2.7	263	4.0	275	C/C	–
22	04	1974	0614	-53	51.9	-32	40.7	1806.7	3.1	273	4.0	275	SATL	0.25
22	04	1974	0630	-53	51.9	-32	42.1	1807.5	3.2	305	4.0	300	C/C	–
22	04	1974	0732	-53	50.0	-32	46.7	1810.8	3.2	312	4.0	300	SATL	0.25
22	04	1974	0838	-53	47.6	-32	51.1	1814.3	3.2	312	4.0	300	C/S	–
22	04	1974	0928	-53	45.8	-32	54.5	1817.0	2.5	306	4.0	300	SATL	0.00
22	04	1974	0930	-53	45.8	-32	54.6	1817.1	8.3	325	9.6	320	C/CS	–
22	04	1974	1034	-53	38.5	-33	3.1	1825.9	8.8	326	9.6	320	SATL	1.00

TABLE 1 – *Continued*

Da.	Date Mo.	Yr.	Time	Deg.	Min.	Deg.	Min.	Dist.	Speed	CSE	Speed	CSE	CMNT	QLTY
22	04	1974	1114	-53	33.6	-33	8.6	1831.8	8.6	323	9.6	320	SATL	1.50
22	04	1974	1220	-53	26.0	-33	18.1	1841.3	9.1	325	9.6	320	SATL	1.50
22	04	1974	1305	-53	20.4	-33	24.7	1848.1	5.1	329	5.6	320	C/S	–
22	04	1974	1311	-53	20.0	-33	25.1	1848.6	9.1	325	9.6	320	C/S	–
22	04	1974	1320	-53	18.9	-33	26.4	1849.9	9.2	320	9.6	320	SATL	1.50
22	04	1974	1406	-53	14.4	-33	35.4	1857.0	9.7	305	9.6	305	SATL	1.50
22	04	1974	1416	-53	13.5	-33	37.6	1858.6	9.7	320	9.6	320	C/C	–
22	04	1974	1428	-53	12.0	-33	39.7	1860.6	9.7	325	9.6	325	C/C	–
22	04	1974	1510	-53	6.4	-33	46.2	1867.4	9.7	318	9.6	325	SATL	1.00
22	04	1974	1536	-53	3.3	-33	50.9	1871.6	10.1	324	9.6	325	SATL	1.00
22	04	1974	1550	-53	1.4	-33	53.2	1873.9	10.1	300	9.6	300	C/C	–
22	04	1974	1555	-53	1.0	-33	54.4	1874.8	10.1	319	9.6	320	C/C	–
22	04	1974	1636	-52	55.7	-34	1.9	1881.6	10.1	327	9.6	328	C/C	–
22	04	1974	1706	-52	51.5	-34	6.4	1886.7	10.5	325	9.6	328	SATL	1.00
22	04	1974	1730	-52	48.0	-34	10.4	1890.9	10.4	336	9.6	340	C/C	–
22	04	1974	1755	-52	44.1	-34	13.3	1895.2	10.5	325	9.6	328	C/C	–
22	04	1974	1815	-52	41.2	-34	16.6	1898.8	10.4	334	9.6	338	C/C	–
22	04	1974	1852	-52	35.4	-34	21.2	1905.2	9.6	336	9.6	338	SATL	0.25
22	04	1974	1852	-52	35.4	-34	21.2	1905.2	9.7	318	9.6	320	C/C	–
22	04	1974	1900	-52	34.4	-34	22.6	1906.5	9.8	308	9.6	310	C/C	–
22	04	1974	1910	-52	33.4	-34	24.7	1908.1	6.8	307	6.6	310	C/C	–
22	04	1974	1950	-52	30.7	-34	30.6	1912.6	6.6	335	6.6	338	C/C	–
22	04	1974	1957	-52	30.0	-34	31.2	1913.4	5.6	334	5.6	338	C/S	–
22	04	1974	2030	-52	27.2	-34	33.4	1916.5	5.7	326	5.6	330	C/C	–
22	04	1974	2138	-52	21.9	-34	39.2	1922.9	4.6	338	5.6	330	SATL	0.50
22	04	1974	2242	-52	17.4	-34	42.2	1927.7	5.0	334	5.6	330	SATL	0.50
22	04	1974	2302	-52	15.8	-34	43.0	1929.4	4.6	321	5.6	310	C/C	–
22	04	1974	2310	-52	15.3	-34	43.6	1930.0	3.0	327	4.0	310	C/S	–
22	04	1974	2312	-52	15.2	-34	43.7	1930.1	4.1	322	5.1	310	C/S	–
22	04	1974	2330	-52	14.2	-34	44.9	1931.4	5.6	319	6.6	310	C/S	–
22	04	1974	2342	-52	13.4	-34	46.1	1932.5	6.0	328	6.6	310	SATL	1.00
23	04	1974	0000	-52	11.9	-34	47.6	1934.3	6.0	328	6.6	310		–
23	04	1974	0035	-52	8.8	-34	50.7	1937.8	4.8	281	6.6	270	C/C	–
23	04	1974	0110	-52	8.3	-34	55.1	1940.6	2.1	64	0.0	265	C/CS	–
23	04	1974	0236	-52	7.0	-34	50.7	1943.6	0.8	2	0.0	265	SATL	1.50
23	04	1974	0456	-52	5.1	-34	50.6	1945.5	0.7	327	0.0	265	SATL	1.50
23	04	1974	0456	-52	5.1	-34	50.6	1945.5	0.7	327	0.0	263	C/C	–
23	04	1974	0830	-52	3.1	-34	52.7	1947.9	2.1	24	0.0	263	SATL	1.50
23	04	1974	0830	-52	3.1	-34	52.7	1947.9	2.1	24	0.0	260	C/C	–
23	04	1974	0900	-52	2.1	-34	52.0	1949.0	10.1	344	8.6	335	C/CS	–
23	04	1974	1042	-51	45.6	-34	59.7	1966.2	8.6	341	8.6	335	SATL	1.00
23	04	1974	1100	-51	43.1	-35	1.1	1968.8	9.6	335	9.6	330	C/C	–
23	04	1974	1108	-51	42.0	-35	1.9	1970.0	5.6	339	5.6	330	C/S	–
23	04	1974	1118	-51	41.1	-35	2.5	1971.0	9.6	335	9.6	330	C/S	–
23	04	1974	1145	-51	37.2	-35	5.3	1975.3	7.6	337	7.6	330	C/S	–
23	04	1974	1228	-51	32.2	-35	8.8	1980.7	5.6	339	5.6	330	C/S	–
23	04	1974	1234	-51	31.7	-35	9.1	1981.3	4.9	351	5.6	330	SATL	0.50
23	04	1974	1252	-51	30.2	-35	9.5	1982.7	8.8	342	9.6	330	C/S	–
23	04	1974	1314	-51	27.2	-35	11.1	1985.9	10.2	329	9.6	330	SATL	0.25
23	04	1974	1418	-51	17.8	-35	20.0	1996.9	9.5	324	9.6	330	SATL	1.50
23	04	1974	1446	-51	14.2	-35	24.2	2001.3	9.8	329	9.6	330	SATL	1.50
23	04	1974	1710	-50	54.1	-35	43.5	2024.8	10.3	327	9.6	330	SATL	1.00
23	04	1974	1750	-50	48.3	-35	49.4	2031.6	10.3	325	9.6	328	C/C	–
23	04	1974	1818	-50	44.4	-35	53.7	2036.4	9.4	326	9.6	328	SATL	1.50
23	04	1974	1930	-50	35.1	-36	3.5	2047.7	4.1	324	4.3	328	C/S	–
23	04	1974	1935	-50	34.8	-36	3.9	2048.0	6.4	325	6.6	328	C/S	–
23	04	1974	2040	-50	29.1	-36	10.0	2054.9	6.2	332	6.6	328	SATL	1.00
23	04	1974	2150	-50	22.7	-36	15.4	2062.2	6.4	330	6.6	328	SATL	0.25
23	04	1974	2252	-50	17.0	-36	20.6	2068.8	6.6	332	6.6	328	SATL	0.50
23	04	1974	2321	-50	14.2	-36	22.9	2072.0	6.6	328	6.6	324	C/C	–
24	04	1974	0000	-50	10.6	-36	26.4	2076.2	6.6	328	6.6	324		–
24	04	1974	0020	-50	8.7	-36	28.2	2078.4	6.5	331	6.6	324	SATL	1.50
24	04	1974	0116	-50	3.4	-36	32.7	2084.4	6.6	332	6.6	324	SATL	1.50
24	04	1974	0132	-50	1.8	-36	34.0	2086.2	5.6	334	5.6	324	C/S	–
24	04	1974	0224	-49	57.5	-36	37.3	2091.0	5.7	334	5.6	324	SATL	1.00
24	04	1974	0336	-49	51.4	-36	41.9	2097.8	6.0	335	5.6	324	SATL	1.50
24	04	1974	0500	-49	43.7	-36	47.4	2106.3	5.7	118	5.6	130	C/C	–
24	04	1974	0522	-49	44.7	-36	44.5	2108.3	5.5	111	5.6	130	SATL	1.00

TABLE 1 – *Continued*

Da.	Date Mo.	Yr.	Time	Deg.	Min.	Deg.	Min.	Dist.	Speed	CSE	Speed	CSE	CMNT	QLTY
24	04	1974	0615	-49	46.4	-36	37.4	2113.3	3.8	226	5.6	220	C/C	–
24	04	1974	0645	-49	47.7	-36	39.5	2115.1	3.9	181	5.6	190	C/C	–
24	04	1974	0700	-49	48.7	-36	39.5	2116.1	5.6	190	5.6	190	S328	1.50
30	04	1974	2114	-49	48.7	-36	39.5	2116.1	5.7	261	4.6	261	U/W	–
30	04	1974	2212	-49	49.6	-36	48.0	2121.7	4.2	252	4.6	261	SATL	1.50
30	04	1974	2342	-49	51.6	-36	57.2	2127.9	4.0	267	4.6	275	C/C	–
30	04	1974	2354	-49	51.6	-36	58.4	2128.7	3.7	257	4.6	275	SATL	1.00
30	04	1974	2357	-49	51.6	-36	58.7	2128.9	3.3	282	4.6	295	C/C	–
01	05	1974	0000	-49	51.6	-36	48.9	2129.0	3.3	282	4.6	295		–
01	05	1974	0050	-49	51.0	-37	3.1	2131.8	4.1	241	4.6	261	C/C	–
01	05	1974	0105	-49	51.5	-37	4.5	2132.8	3.3	282	4.6	295	C/C	–
01	05	1974	0115	-49	51.4	-37	5.3	2133.3	4.3	285	5.6	295	C/S	–
01	05	1974	0155	-49	50.7	-37	9.6	2136.2	4.8	255	5.6	270	C/C	–
01	05	1974	0156	-49	50.7	-37	9.7	2136.3	3.9	254	5.6	270	SATL	1.00
01	05	1974	0211	-49	51.0	-37	11.1	2137.2	4.1	242	5.6	261	C/C	–
01	05	1974	0315	-49	53.1	-37	17.1	2141.6	4.5	229	5.6	251	C/C	–
01	05	1974	0318	-49	53.2	-37	17.4	2141.9	4.1	232	5.6	251	SATL	0.50
01	05	1974	0355	-49	54.8	-37	20.5	2144.4	3.8	245	5.6	261	C/C	–
01	05	1974	0530	-49	57.3	-37	29.0	2150.4	4.5	241	5.6	261	SATL	1.00
01	05	1974	0600	-49	58.4	-37	32.1	2152.7	3.8	272	5.6	285	C/C	–
01	05	1974	0610	-49	58.4	-37	33.0	2153.3	2.8	268	4.6	285	C/S	–
01	05	1974	0620	-49	58.4	-37	33.8	2153.8	3.0	0	4.6	340	C/C	–
01	05	1974	0830	-49	51.8	-37	33.7	2160.3	3.2	353	4.6	340	SATL	1.00
01	05	1974	0935	-49	48.3	-37	34.3	2163.8	3.7	351	5.1	340	C/S	–
01	05	1974	0940	-49	48.0	-37	34.4	2164.2	8.1	252	9.0	261	C/CS	–
01	05	1974	1058	-49	51.3	-37	49.9	2174.7	8.3	250	9.0	261	SATL	1.00
01	05	1974	1110	-49	51.9	-37	52.3	2176.3	7.9	265	9.0	275	C/C	–
01	05	1974	1145	-49	52.3	-37	59.5	2181.0	7.7	276	9.0	285	C/C	–
01	05	1974	1210	-49	51.9	-38	4.4	2184.1	4.7	271	6.0	285	C/S	–
01	05	1974	1218	-49	51.9	-38	5.4	2184.8	6.2	274	7.5	285	C/S	–
01	05	1974	1233	-49	51.8	-38	7.7	2186.3	7.7	276	9.0	285	C/S	–
01	05	1974	1248	-49	51.6	-38	10.7	2188.2	7.8	275	9.0	285	SATL	1.50
01	05	1974	1300	-49	51.5	-38	13.1	2189.8	7.2	343	9.0	340	C/C	–
01	05	1974	1303	-49	51.1	-38	13.3	2190.2	7.2	349	9.0	345	C/C	–
01	05	1974	1342	-49	46.5	-38	14.7	2194.9	7.2	344	9.0	345	SATL	0.25
01	05	1974	1410	-49	43.3	-38	16.1	2198.2	7.2	354	9.0	353	C/C	–
01	05	1974	1415	-49	42.7	-38	16.2	2198.8	7.2	344	9.0	345	C/C	–
01	05	1974	1434	-49	40.5	-38	17.2	2201.1	7.1	348	9.0	345	SATL	0.50
01	05	1974	1445	-49	39.2	-38	17.6	2202.4	7.1	342	9.0	340	C/C	–
01	05	1974	1500	-49	37.5	-38	18.5	2204.2	7.1	348	9.0	345	C/C	–
01	05	1974	1545	-49	32.3	-38	20.2	2209.5	7.2	0	9.0	355	C/C	–
01	05	1974	1635	-49	26.3	-38	20.2	2215.5	7.1	348	9.0	345	C/C	–
01	05	1974	1712	-49	22.0	-38	21.6	2219.9	7.5	353	9.0	345	SATL	0.50
01	05	1974	1800	-49	16.0	-38	22.7	2225.9	7.2	297	9.0	300	C/C	–
01	05	1974	1815	-49	15.2	-38	25.2	2227.7	7.2	291	9.0	295	C/C	–
01	05	1974	1830	-49	14.6	-38	27.7	2229.5	7.4	279	9.0	285	C/C	–
01	05	1974	1850	-49	14.2	-38	31.4	2232.0	7.4	272	9.0	280	C/C	–
01	05	1974	1922	-49	14.0	-38	37.5	2235.9	7.4	347	9.0	340	C/C	–
01	05	1974	1924	-49	13.8	-38	37.6	2236.2	6.6	342	9.0	340	SATL	0.00
01	05	1974	1927	-49	13.5	-38	37.8	2236.5	6.7	315	9.0	320	C/C	–
01	05	1974	2030	-49	8.5	-38	45.5	2243.6	5.5	313	7.8	320	C/S	–
01	05	1974	2051	-49	7.2	-38	47.6	2245.5	5.0	313	7.3	320	C/S	–
01	05	1974	2110	-49	6.1	-38	49.4	2247.1	4.6	335	7.2	320	SATL	1.50
01	05	1974	2145	-49	3.7	-38	51.2	2249.8	4.2	302	7.3	300	C/C	–
01	05	1974	2304	-49	0.7	-38	58.4	2255.4	4.9	323	7.3	300	SATL	1.50
02	05	1974	0000	-48	57.1	-39	2.6	2260.0	4.1	237	7.3	250	C/C	–
02	05	1974	0029	-48	58.1	-39	5.1	2262.0	4.1	237	7.3	250	C/C	–
02	05	1974	0135	-49	0.6	-39	10.9	2266.5	5.2	240	8.4	250	C/S	–
02	05	1974	0220	-49	2.6	-39	16.0	2270.4	4.7	239	7.9	250	C/S	–
02	05	1974	0250	-49	3.8	-39	19.1	2272.7	4.5	235	7.9	250	SATL	1.00
02	05	1974	0345	-49	6.1	-39	24.3	2276.9	4.9	219	7.9	240	C/C	–
02	05	1974	0400	-49	7.1	-39	25.4	2278.1	4.5	235	7.9	250	C/C	–
02	05	1974	0415	-49	7.7	-39	26.8	2279.2	4.9	219	7.9	240	C/C	–
02	05	1974	0538	-49	13.0	-39	33.4	2286.0	3.2	222	7.9	240	SATL	1.00
02	05	1974	0600	-49	13.9	-39	34.6	2287.2	3.4	223	8.1	240	C/S	–
02	05	1974	0620	-49	14.7	-39	35.8	2288.3	3.2	247	8.1	250	C/C	–
02	05	1974	0630	-49	14.9	-39	36.5	2288.8	2.0	245	6.9	250	C/S	–
02	05	1974	0713	-49	15.5	-39	38.5	2290.2	1.0	241	5.9	250	C/S	–

TABLE 1 – *Continued*

Da.	Date Mo.	Yr.	Time	Deg.	Min.	Deg.	Min.	Dist.	Speed	CSE	Speed	CSE	CMNT	QLTY
02	05	1974	0828	-49	16.1	-39	40.1	2291.4	0.4	261	5.9	250	SATL	1.50
02	05	1974	1008	-49	16.2	-39	41.1	2292.1	1.2	253	5.9	250	SATL	1.00
02	05	1974	1154	-49	16.8	-39	44.1	2294.2	1.8	268	5.9	250	SATL	1.50
02	05	1974	1315	-49	16.9	-39	47.8	2296.6	2.2	295	5.9	260	C/C	–
02	05	1974	1346	-49	16.4	-39	49.4	2297.7	3.5	285	5.9	260	SATL	0.50
02	05	1974	1350	-49	16.3	-39	49.7	2297.9	4.4	279	6.9	260	C/S	–
02	05	1974	1420	-49	16.0	-39	53.1	2300.1	3.8	246	6.9	240	C/C	–
02	05	1974	1436	-49	16.4	-39	54.5	2301.2	4.1	247	6.9	240	SATL	1.00
02	05	1974	1440	-49	16.5	-39	54.9	2301.4	4.0	239	6.9	235	C/C	–
02	05	1974	1624	-49	20.1	-40	4.0	2308.4	4.2	238	6.9	235	SATL	0.50
02	05	1974	1735	-49	22.7	-40	10.4	2313.3	4.1	229	6.9	230	C/C	–
02	05	1974	2004	-49	29.4	-40	22.4	2323.6	4.5	228	6.9	230	SATL	0.50
02	05	1974	2015	-49	29.9	-40	23.4	2324.4	4.7	259	6.9	250	C/C	–
02	05	1974	2305	-49	32.5	-40	43.3	2337.6	6.3	256	8.6	250	C/S	–
02	05	1974	2350	-49	33.6	-40	50.4	2342.3	6.8	256	9.1	250	C/S	–
03	05	1974	0000	-49	33.9	-40	52.1	2343.5	7.1	254	9.1	250	SATL	1.00
03	05	1974	0000	-49	33.9	-40	52.1	2343.5	7.1	254	9.1	250		–
03	05	1974	0154	-49	38.0	-41	13.3	2357.8	8.1	250	9.6	250	SATL	0.25
03	05	1974	0326	-49	42.2	-41	31.3	2370.2	8.9	249	9.6	250	SATL	0.50
03	05	1974	0340	-49	43.0	-41	34.3	2372.3	8.4	249	9.1	250	C/S	–
03	05	1974	0436	-49	45.8	-41	45.6	2380.1	7.8	246	9.1	250	SATL	0.25
03	05	1974	0514	-49	47.8	-41	52.6	2385.1	8.1	250	9.1	250	SATL	1.00
03	05	1974	0540	-49	49.0	-41	57.7	2388.6	8.1	249	9.1	250	SATL	1.50
03	05	1974	0645	-49	52.2	-42	10.3	2397.3	8.0	254	9.1	255	C/C	–
03	05	1974	0726	-49	53.7	-42	18.5	2402.8	8.1	252	9.1	255	SATL	1.50
03	05	1974	0926	-49	58.8	-42	42.5	2419.1	7.9	257	9.1	255	SATL	1.50
03	05	1974	1102	-50	1.7	-43	1.6	2431.7	8.4	256	9.1	255	SATL	0.50
03	05	1974	1114	-50	2.1	-43	4.2	2433.4	8.9	256	9.6	255	C/S	–
03	05	1974	1145	-50	3.2	-43	11.1	2438.0	8.9	254	9.6	253	C/C	–
03	05	1974	1215	-50	4.4	-43	17.8	2442.4	3.6	256	4.3	253	C/S	–
03	05	1974	1220	-50	4.5	-43	18.3	2442.7	8.9	254	9.6	253	C/S	–
03	05	1974	1250	-50	5.7	-43	25.0	2447.2	8.7	256	9.6	253	SATL	1.00
03	05	1974	1350	-50	7.8	-43	38.1	2455.9	8.2	257	9.6	253	SATL	1.00
03	05	1974	1415	-50	8.6	-43	43.3	2459.3	8.1	251	9.6	248	C/C	–
03	05	1974	1604	-50	13.4	-44	5.0	2474.0	10.9	250	9.6	248	SATL	0.25
03	05	1974	1650	-50	16.2	-44	17.3	2482.3	10.8	247	9.6	244	C/C	–
03	05	1974	1714	-50	17.9	-44	23.5	2486.7	10.1	250	9.6	244	SATL	0.50
03	05	1974	1748	-50	19.9	-44	31.9	2492.4	9.1	243	9.6	244	SATL	1.00
03	05	1974	1835	-50	23.1	-44	41.9	2499.5	9.1	245	9.6	246	C/C	–
03	05	1974	1858	-50	24.6	-44	46.9	2503.1	9.1	245	9.6	246	SATL	1.00
03	05	1974	2042	-50	31.3	-45	9.4	2518.9	9.1	242	9.6	246	SATL	1.50
03	05	1974	2120	-50	34.0	-45	17.4	2524.6	9.0	253	9.6	256	C/C	–
03	05	1974	2230	-50	37.0	-45	33.2	2535.1	8.5	259	9.6	256	SATL	0.25
03	05	1974	2308	-50	38.0	-45	41.5	2540.4	9.1	258	9.6	256	SATL	1.50
03	05	1974	2338	-50	39.0	-45	48.5	2545.0	9.2	267	9.6	265	C/C	–
04	05	1974	0000	-50	39.1	-45	53.8	2548.3	9.2	267	9.6	265		–
04	05	1974	0010	-50	39.2	-45	56.2	2549.9	5.2	269	5.6	265	C/S	–
04	05	1974	0120	-50	39.3	-46	5.7	2555.9	5.6	265	5.6	265	S329	1.50
06	05	1974	0032	-50	39.3	-46	5.7	2555.9	5.4	209	5.6	205	U/W	–
06	05	1974	0033	-50	39.4	-46	5.8	2556.0	8.7	247	8.6	244	C/CS	–
06	05	1974	0043	-50	39.9	-46	7.9	2557.4	7.7	247	7.6	244	C/S	–
06	05	1974	0054	-50	40.5	-46	9.9	2558.8	7.1	246	7.6	244	SATL	1.00
06	05	1974	0248	-50	46.0	-46	29.2	2572.2	7.2	245	7.6	244	SATL	1.00
06	05	1974	0340	-50	48.6	-46	38.1	2578.5	7.2	241	7.6	240	C/C	–
06	05	1974	0415	-50	50.7	-46	43.9	2582.6	7.2	230	7.6	230	C/C	–
06	05	1974	0430	-50	51.9	-46	46.1	2584.4	5.2	230	5.6	230	C/S	–
06	05	1974	0458	-50	53.4	-46	49.0	2586.8	4.2	234	5.6	230	SATL	1.50
06	05	1974	0542	-50	55.2	-46	53.0	2589.9	5.6	230	5.6	230	S330	1.50
08	05	1974	2213	-50	55.2	-46	52.8	2590.1	6.6	255	6.6	255	U/W	–
08	05	1974	2214	-50	55.2	-46	53.0	2590.2	4.2	233	6.6	255	DEP	1.50
09	05	1974	0000	-50	59.6	-47	2.4	2597.5	4.2	233	6.6	255		–
09	05	1974	0030	-51	0.8	-47	5.1	2599.6	7.8	49	6.6	26	C/C	–
09	05	1974	0035	-51	0.4	-47	4.3	2600.3	9.7	44	8.6	26	C/S	–
09	05	1974	0057	-50	57.9	-47	0.4	2603.8	8.4	21	8.6	0	C/C	–
09	05	1974	0142	-50	52.0	-46	56.8	2610.1	6.0	14	8.6	0	SATL	1.00
09	05	1974	0210	-50	49.3	-46	55.7	2612.9	6.4	8	8.6	0	SATL	0.25
09	05	1974	0356	-50	38.1	-46	53.1	2624.2	5.9	9	8.6	0	SATL	0.50
09	05	1974	0454	-50	32.5	-46	51.7	2629.9	6.3	7	8.6	0	SATL	0.25
09	05	1974	0544	-50	27.3	-46	50.7	2635.1	6.0	3	8.6	0	SATL	1.00
09	05	1974	0605	-50	25.2	-46	50.5	2637.2	6.3	24	8.6	15	C/C	–
09	05	1974	0608	-50	24.9	-46	50.3	2637.6	7.4	17	8.6	15	SATL	1.00
09	05	1974	0808	-50	10.7	-46	43.7	2652.4	7.6	19	8.6	15	SATL	1.00
09	05	1974	0956	-49	57.8	-46	36.9	2666.0	8.0	16	8.6	15	SATL	1.50
09	05	1974	1005	-49	56.6	-46	36.4	2667.2	9.0	27	9.6	25	C/CS	–
09	05	1974	1142	-49	43.6	-46	26.3	2681.8	8.9	24	9.6	25	SATL	1.50
09	05	1974	1244	-49	35.2	-46	20.6	2690.9	8.9	21	9.6	25	SATL	1.00

TABLE 1 – *Continued*

Da.	Date Mo.	Yr.	Time	Deg.	Min.	Deg.	Min.	Dist.	Speed	CSE	Speed	CSE	CMNT	QLTY
09	05	1974	1450	-49	17.8	-46	10.4	2709.6	8.9	23	9.6	25	SATL	0.50
09	05	1974	1604	-49	7.7	-46	3.7	2720.6	9.1	24	9.6	25	SATL	1.00
09	05	1974	1645	-49	2.0	-45	59.8	2726.8	9.1	27	9.6	28	C/C	–
09	05	1974	1736	-48	55.2	-45	54.4	2734.5	8.5	32	9.6	28	SATL	1.00
09	05	1974	2016	-48	36.0	-45	36.2	2757.1	9.2	34	9.6	28	SATL	0.50
09	05	1974	2158	-48	23.1	-45	22.9	2772.8	9.8	34	9.6	28	SATL	1.00
09	05	1974	2300	-48	14.7	-45	14.5	2782.8	9.4	27	9.6	28	SATL	0.25
09	95	1974	2315	-48	12.6	-45	12.9	2785.2	9.4	8	9.6	10	C/C	–
10	05	1974	0000	-48	5.6	-45	11.3	2792.2	9.4	8	9.6	10		–
10	05	1974	0102	-47	56.0	-45	9.2	2802.0	8.9	10	9.6	10	SATL	1.50
10	05	1974	0234	-47	42.6	-45	5.6	2815.6	8.8	8	9.6	10	SATL	0.50
10	05	1974	0312	-47	37.1	-45	4.4	2821.2	8.4	11	9.6	10	SATL	0.25
10	05	1974	0420	-47	27.7	-45	1.7	2830.7	8.5	22	9.6	20	C/C	–
10	05	1974	0456	-47	23.0	-44	58.8	2835.8	8.5	18	9.6	20	SATL	1.00
10	05	1974	0530	-47	18.4	-44	56.6	2840.6	8.7	31	9.6	20	SATL	1.00
10	05	1974	0700	-47	7.3	-44	46.6	2853.6	6.6	11	8.1	0	C/CS	–
10	05	1974	0740	-47	3.0	-44	45.5	2858.0	6.2	346	8.1	340	C/C	–
10	05	1974	0906	-46	54.4	-44	48.7	2866.9	6.7	348	8.1	340	SATL	1.50
10	05	1974	0950	-46	49.6	-44	50.2	2871.8	7.2	11	8.1	0	C/C	–
10	05	1974	1000	-46	48.4	-44	49.9	2873.0	8.9	36	9.1	25	C/CS	–
10	05	1974	1024	-46	45.5	-44	46.9	2876.6	9.6	26	9.1	25	SATL	0.50
10	05	1974	1030	-46	44.6	-44	46.3	2877.6	9.7	59	9.1	60	C/C	–
10	05	1974	1100	-46	42.2	-44	40.2	2882.4	10.2	59	9.6	60	C/S	–
10	05	1974	1210	-46	36.1	-44	25.4	2894.2	10.1	58	9.6	60	SATL	1.00
10	05	1974	1220	-46	35.2	-44	23.3	2895.9	10.1	48	9.6	50	C/C	–
10	05	1974	1336	-46	26.7	-44	9.4	2908.7	10.5	49	9.6	50	SATL	1.50
10	05	1974	1512	-46	15.6	-43	51.2	2925.5	10.6	45	9.6	50	SATL	0.50
10	05	1974	1655	-46	2.7	-43	32.7	2943.7	10.7	36	9.6	40	C/C	–
10	05	1974	1702	-46	1.7	-43	31.6	2944.9	10.8	38	9.6	40	SATL	1.00
10	05	1974	1730	-45	57.7	-43	27.1	2950.0	10.9	34	9.6	35	C/C	–
10	05	1974	1825	-45	49.4	-43	19.2	2960.0	10.2	34	8.9	35	C/S	–
10	05	1974	1912	-45	42.8	-43	12.9	2967.9	10.2	34	8.9	35	SATL	0.25
10	05	1974	1935	-45	39.6	-43	9.8	2971.8	10.9	34	9.6	35	C/S	–
10	05	1974	2010	-45	34.3	-43	4.7	2978.2	10.9	29	9.6	30	C/C	–
10	05	1974	2110	-45	24.8	-42	57.1	2989.0	9.9	27	9.6	30	SATL	1.50
10	05	1974	2206	-45	16.5	-42	51.2	2998.3	10.1	29	9.6	30	SATL	0.50
10	05	1974	2258	-45	8.8	-42	45.2	3007.1	10.0	28	9.6	30	SATL	1.50
10	05	1974	2340	-45	2.6	-42	40.6	3014.1	10.0	23	9.6	25	C/C	–
11	05	1974	0000	-44	59.5	-42	38.8	3017.4	10.0	23	9.6	25		–
11	05	1974	0010	-44	58.0	-42	37.9	3019.1	9.5	23	9.6	25	SATL	1.50
11	05	1974	0140	-44	44.9	-42	30.2	3033.3	9.3	20	9.6	25	SATL	1.00
11	05	1974	0200	-44	42.0	-42	28.7	3036.4	9.2	23	9.6	25	SATL	1.00
11	05	1974	0220	-44	39.2	-42	27.0	3039.4	9.4	22	9.6	25	SATL	1.00
11	05	1974	0408	-44	23.5	-42	18.2	3056.3	9.2	22	9.6	25	SATL	1.50
11	05	1974	0606	-44	6.7	-42	8.9	3074.4	9.1	22	9.6	25	SATL	1.00
11	05	1974	0752	-43	51.8	-42	0.5	3090.5	8.9	25	9.6	25	SATL	1.50
11	05	1974	0818	-43	48.3	-41	58.2	3094.3	9.4	25	9.7	25	SATL	1.50
11	05	1974	1006	-43	32.9	-41	48.4	3111.3	9.2	22	9.6	25	SATL	1.00
11	05	1974	1120	-43	22.4	-41	42.5	3122.6	9.7	26	9.6	25	SATL	1.00
11	05	1974	1244	-43	10.2	-41	34.2	3136.3	9.8	27	9.6	25	SATL	1.50
11	05	1974	1308	-43	6.7	-41	31.8	3140.2	9.5	24	9.6	25	SATL	1.00
11	05	1974	1426	-42	55.4	-41	24.8	3152.6	9.9	24	9.6	25	SATL	1.00
11	05	1974	1612	-42	39.3	-41	15.2	3170.1	10.3	25	9.6	25	SATL	1.00
11	05	1974	1708	-42	30.6	-41	9.7	3179.7	9.9	22	9.6	25	SATL	0.50
11	05	1974	1816	-42	20.2	-41	3.9	3191.0	9.9	23	9.6	25	SATL	1.50
11	05	1974	2022	-42	1.1	-40	53.0	3211.7	10.3	24	9.6	25	SATL	1.50
11	05	1974	2100	-41	55.1	-40	49.4	3218.3	10.3	26	9.6	27	C/C	–
11	05	1974	2206	-41	44.9	-40	42.8	3229.6	11.0	29	9.6	27	SATL	1.00
11	05	1974	2256	-41	36.9	-40	36.9	3238.8	11.0	25	9.6	27	SATL	1.00
11	05	1974	2322	-41	32.6	-40	34.2	3243.5	11.2	24	9.6	27	SATL	0.50
12	05	1974	0000	-41	26.1	-40	30.3	3250.6	11.2	24	9.6	27		–
12	05	1974	0038	-41	19.6	-40	26.4	3257.8	11.3	26	9.6	27	SATL	1.00
12	05	1974	0104	-41	15.2	-40	23.5	3262.7	11.4	29	9.6	27	SATL	1.00
12	05	1974	0502	-40	35.7	-39	54.2	3307.9	11.0	28	9.6	27	SATL	1.00
12	05	1974	0832	-40	1.6	-39	30.9	3346.4	10.9	30	9.6	27	SATL	1.00
12	05	1974	1002	-39	47.5	-39	20.3	3362.7	10.4	20	9.6	27	SATL	1.00
12	05	1974	1100	-39	38.1	-39	15.8	3372.7	10.4	18	9.6	25	C/C	–
12	05	1974	1106	-39	37.1	-39	15.4	3373.7	10.0	21	9.6	25	SATL	1.00
12	05	1974	1218	-39	25.9	-39	9.7	3385.8	10.9	18	9.6	25	SATL	1.00

TABLE 1 – *Continued*

Da.	Date Mo.	Yr.	Time	Deg.	Min.	Deg.	Min.	Dist.	Speed	CSE	Speed	CSE	CMNT	QLTY
12	05	1974	1300	-39	18.7	-39	6.6	3393.4	10.8	23	9.6	30	C/C	–
12	05	1974	1522	-38	55.2	-38	53.8	3418.9	8.5	28	9.6	30	SATL	0.50
12	05	1974	1710	-38	41.7	-38	44.4	3434.2	10.2	24	9.6	30	SATL	0.25
12	05	1974	1745	-38	36.3	-38	41.3	3440.2	10.1	32	9.6	38	C/C	–
12	05	1974	1747	-38	36.0	-38	41.1	3440.5	6.1	28	5.6	38	C/S	–
12	05	1974	1800	-38	34.8	-38	40.3	3441.8	10.1	32	9.6	38	C/S	–
12	05	1974	1934	-38	21.4	-38	29.7	3457.6	10.2	37	9.6	38	SATL	0.50
12	05	1974	2204	-38	1.1	-38	10.1	3483.1	10.2	41	9.6	38	SATL	0.25
12	05	1974	2220	-37	59.0	-38	7.9	3485.8	6.0	21	5.6	15	C/CS	–
12	05	1974	2228	-37	58.3	-38	7.5	3486.6	5.2	15	5.6	15	SATL	0.50
12	05	1974	2253	-37	56.2	-38	6.8	3488.7	5.2	359	5.6	0	C/C	–
12	05	1974	2330	-37	53.0	-38	6.9	3492.0	5.6	0	5.6	0	S331	1.50
16	05	1974	2129	-37	50.0	-38	4.2	3495.6	5.4	324	7.6	340	U/W	–
16	05	1974	2130	-37	49.9	-38	4.3	3495.7	6.3	354	9.1	0	C/CS	–
16	05	1974	2234	-37	43.2	-38	5.1	3502.5	5.6	10	9.1	0	SATL	1.10
16	05	1974	2315	-37	39.4	-38	4.2	3506.3	4.9	12	8.4	0	C/S	–
17	05	1974	0000	-37	35.8	-38	3.3	3510.0	4.9	12	8.4	0		–
17	05	1974	0020	-37	34.2	-38	2.9	3511.7	4.7	4	8.4	0	SATL	0.90
17	05	1974	0252	-37	22.3	-38	1.9	3523.6	4.6	359	8.4	0	SATL	0.30
17	05	1974	0642	-37	4.8	-38	2.4	3541.1	5.4	17	8.4	0	SATL	0.00
17	05	1974	0848	-36	53.9	-37	58.1	3552.5	5.3	356	8.4	0	SATL	0.00
17	05	1974	0945	-36	48.9	-37	58.6	3557.5	6.0	356	9.1	0		–
17	05	1974	1036	-36	43.8	-37	59.0	3562.6	6.3	6	9.1	0	SATL	0.00
17	05	1974	1234	-36	31.5	-37	57.4	3575.0	6.7	6	9.1	0	SATL	0.50
17	05	1974	1322	-36	26.2	-37	56.7	3580.3	6.8	9	9.1	0	SATL	-0.60
17	05	1974	1425	-36	19.1	-37	55.3	3587.5	6.5	349	9.0	345	C/C	–
17	05	1974	1435	-36	18.0	-37	55.5	3588.6	6.7	9	9.0	0	C/C	–
17	05	1974	1638	-36	4.4	-37	52.7	3602.4	6.9	357	9.0	0	SATL	0.70
17	05	1974	1916	-35	46.2	-37	53.7	3620.7	7.5	358	9.0	0	SATL	1.20
17	05	1974	2046	-35	35.0	-37	54.3	3631.9	7.1	5	9.0	0	SATL	0.80
17	05	1974	2234	-35	22.2	-37	52.9	3644.7	7.6	0	9.0	0	SATL	0.90
18	05	1974	0026	-35	8.1	-37	52.9	3658.8	7.9	1	9.0	0	SATL	1.20
18	05	1974	0204	-34	55.2	-37	52.7	3671.7	8.1	3	9.0	0	SATL	1.00
18	05	1974	0352	-34	40.6	-37	51.9	3686.3	8.4	3	9.0	0	SATL	1.40
18	05	1974	0556	-34	23.2	-37	50.7	3703.8	8.7	1	9.0	0	SATL	1.50
18	05	1974	0702	-34	13.6	-37	50.5	3713.4	8.8	3	9.0	0	SATL	1.50
18	05	1974	0804	-34	4.5	-37	49.9	3722.5	8.8	4	9.0	0	SATL	1.30
18	05	1974	0946	-33	49.6	-37	48.8	3737.4	8.7	359	9.0	0	SATL	1.60
18	05	1974	1044	-33	41.2	-37	49.0	3745.8	8.5	1	9.0	0	SATL	1.30
18	05	1974	1500	-33	5.0	-37	48.0	3782.0	9.1	347	9.6	347	C/C	–
18	05	1974	1550	-32	57.6	-37	50.0	3789.6	8.4	350	9.6	347	SATL	1.30
18	05	1974	1608	-32	55.1	-37	50.5	3792.1	8.8	340	9.6	347	SATL	0.70
18	05	1974	1810	-32	38.2	-37	57.8	3810.1	8.4	344	9.6	347	SATL	-0.40
18	05	1974	2000	-32	23.4	-38	2.8	3825.5	8.5	347	9.6	347	SATL	-19.70
18	05	1974	2115	-32	13.0	-38	5.7	3836.1	8.5	356	9.6	355	C/C	–
18	05	1974	2238	-32	1.3	-38	6.8	3847.9	8.2	352	9.6	355	SATL	1.30
19	05	1974	0000	-31	50.2	-38	8.5	3859.1	8.2	352	9.6	355		–
19	05	1974	0022	-31	47.2	-38	9.0	3862.1	8.0	354	9.6	355	SATL	1.40
19	05	1974	0304	-31	25.7	-38	11.5	3883.7	7.6	349	9.6	355	SATL	0.70
19	05	1974	0506	-31	10.5	-38	15.1	3899.3	7.3	354	9.6	355	SATL	0.50
19	05	1974	0900	-30	42.3	-38	18.6	3927.6	7.9	353	9.6	355	SATL	0.60
19	05	1974	1138	-30	21.7	-38	21.6	3948.4	8.0	354	9.6	355	SATL	1.20
19	05	1974	1230	-30	14.8	-38	22.4	3955.3	8.0	352	9.6	355	SATL	0.90
19	05	1974	1328	-30	7.1	-38	23.6	3963.1	8.5	353	9.6	355	SATL	-2.60
19	05	1974	1502	-29	53.9	-38	25.6	3976.4	8.7	350	9.6	355	SATL	0.20
19	05	1974	1555	-29	46.3	-38	27.1	3984.1	8.5	25	9.6	26	C/C	–
19	05	1974	1706	-29	37.2	-38	22.3	3994.1	9.1	26	9.6	26	SATL	0.90
19	05	1974	1850	-29	23.0	-38	14.2	4010.0	9.4	25	9.6	26	SATL	1.60
19	05	1974	2052	-29	5.8	-38	4.8	4029.0	9.2	19	9.6	26	SATL	0.20
19	05	1974	2100	-29	4.6	-38	4.3	4030.3	9.0	30	9.6	36	C/C	–
19	05	1974	2244	-28	51.1	-37	55.5	4045.9	9.4	33	9.6	36	SATL	0.00
19	05	1974	2332	-28	44.8	-37	50.8	4053.4	9.7	37	9.6	36	SATL	0.70
20	05	1974	1974	/00	01.2	-41	08.3	4057.9	9.7	37	9.6	36		–
20	05	1974	0022	-28	38.3	-37	45.3	4061.5	9.4	37	9.6	36	SATL	1.00
20	05	1974	0053	-28	34.4	-37	41.9	4066.3	9.3	324	9.6	325	C/C	–
20	05	1974	0404	-28	10.4	-38	1.6	4096.0	9.7	325	9.6	325	SATL	0.70
20	05	1974	0430	-28	7.0	-38	4.4	4100.2	9.5	145	9.6	145	C/C	–
20	05	1974	0505	-28	11.5	-38	0.8	4105.7	5.0	146	5.1	145	C/S	–
20	05	1974	0517	-28	12.3	-38	0.2	4106.7	0.1	298	0.0	500	STOP	–

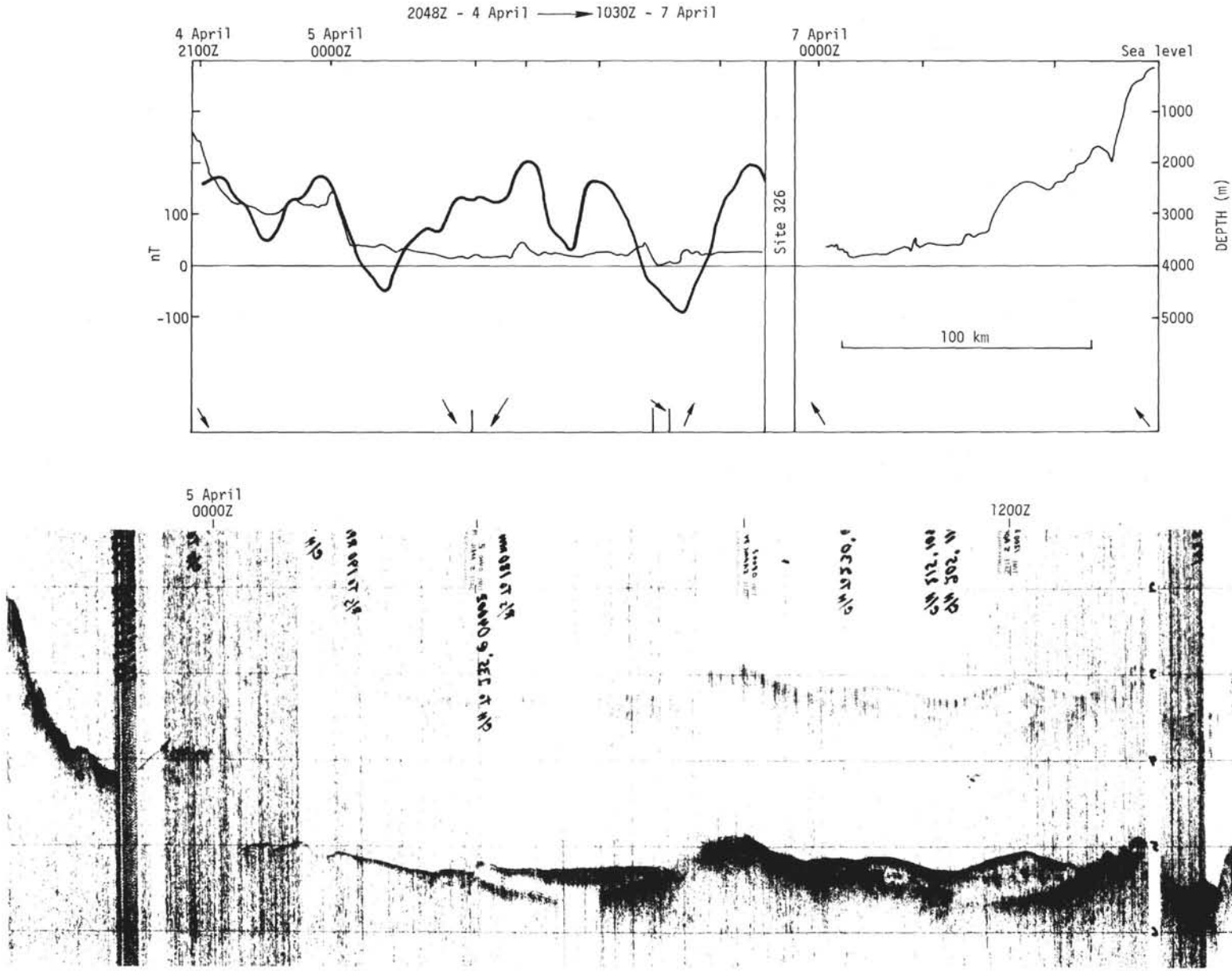

Figure 2. *Bathymetric, magnetic, and reflection profiles,* Glomar Challenger, *Leg 36. 2048, 4 to 1030 7 April 1974. (see also Figures 3 to 17).*

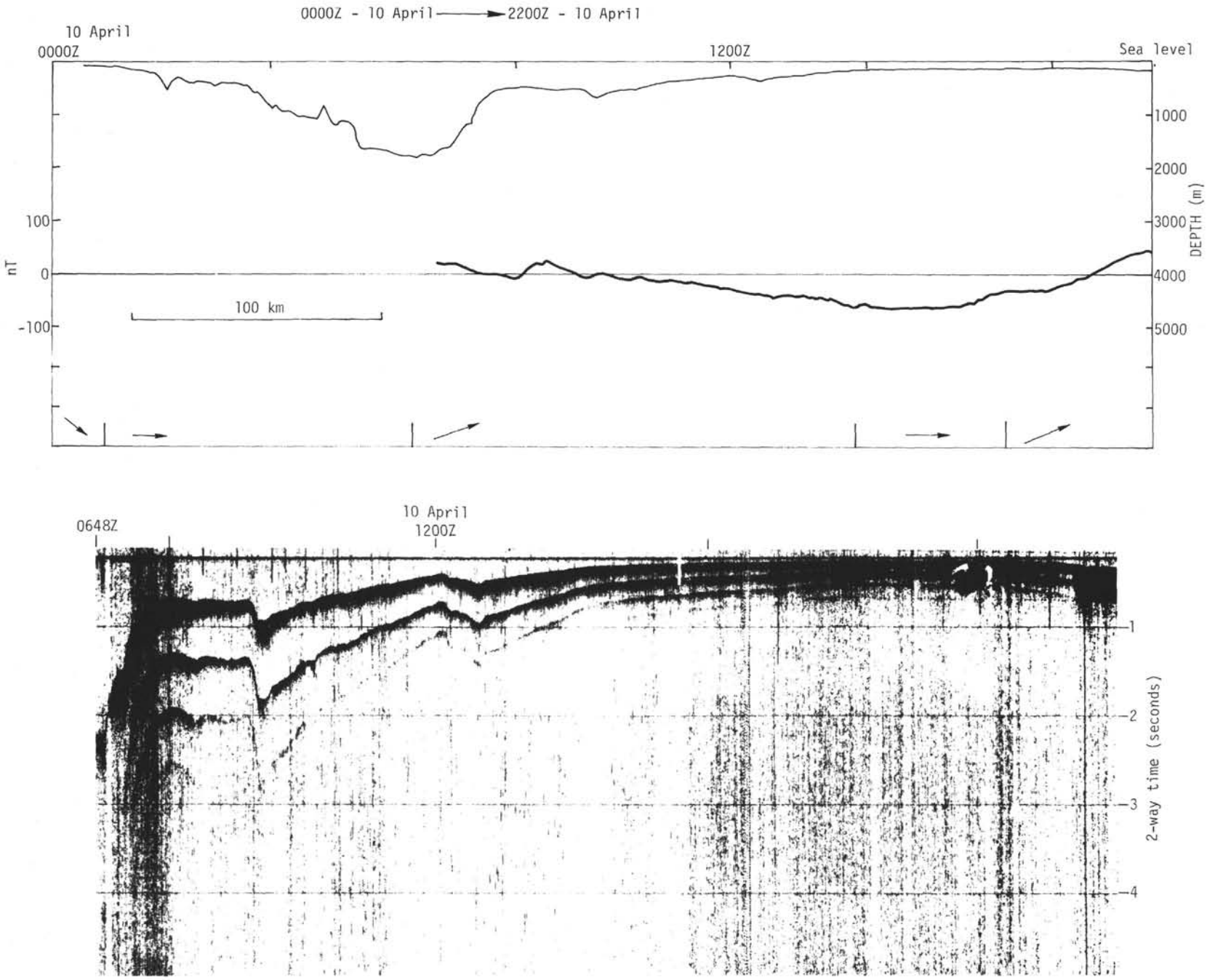

Figure 3. *0000 10 to 2200 10 April.*

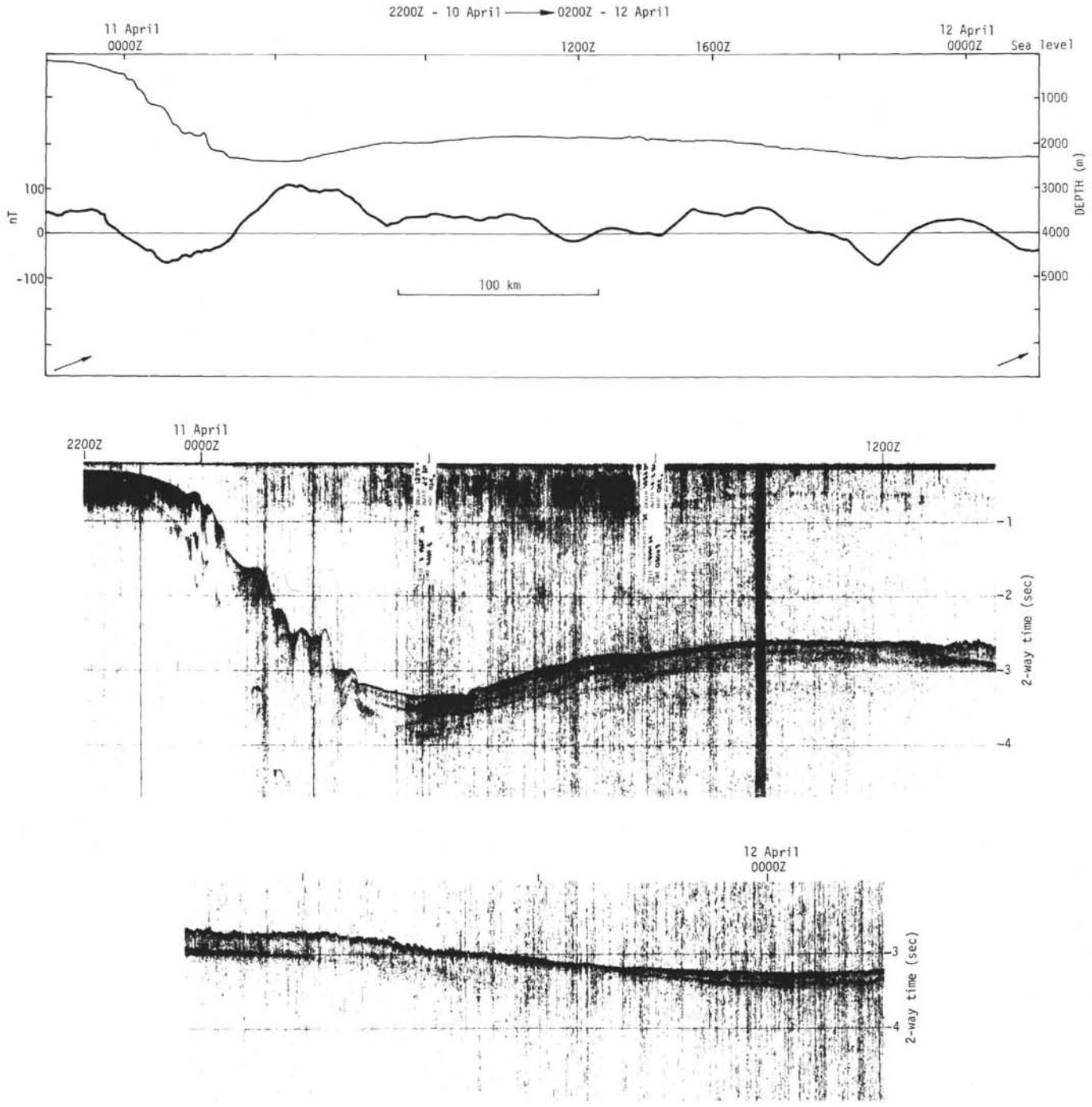

Figure 4. *2200 10 to 0200 12 April.*

aid comparison but, if more precise matching is required, it is necessary to refer to the navigational information contained in Table 1, since the reflection profile is a time section and the magnetics and bathymetry are plotted against distance. For the reflection profile the vertical exaggeration varies only with ship speed, being 33:1 at 10 knots, 20:1 at 6 knots in water, and proportionately less in sediments of higher velocity. Time down the profile is marked in seconds of two-way travel (TW), equivalent to about 750 meters in water and (very roughly) 850 meters in sediments; the sea surface is not usually shown in the reflection profiles of Figures 2 to 17, to save space.

NARRATIVE

The collection of underway geophysical data did not start before the edge of the South American continental margin, about 170 km out of Ushuaia. The purpose of Site 326 was to find a basement age, to assist the magnetic anomaly dating of the opening of Drake Passage (Barker, 1970). Magnetic lineations are oriented along 035°, and fracture zones are frequent around the site; the magnetic profile along this outward track alone is thus of limited use. Closer to the site two parallel tracks along 210° and 030° were followed, to define more closely the disposition of the sediments to

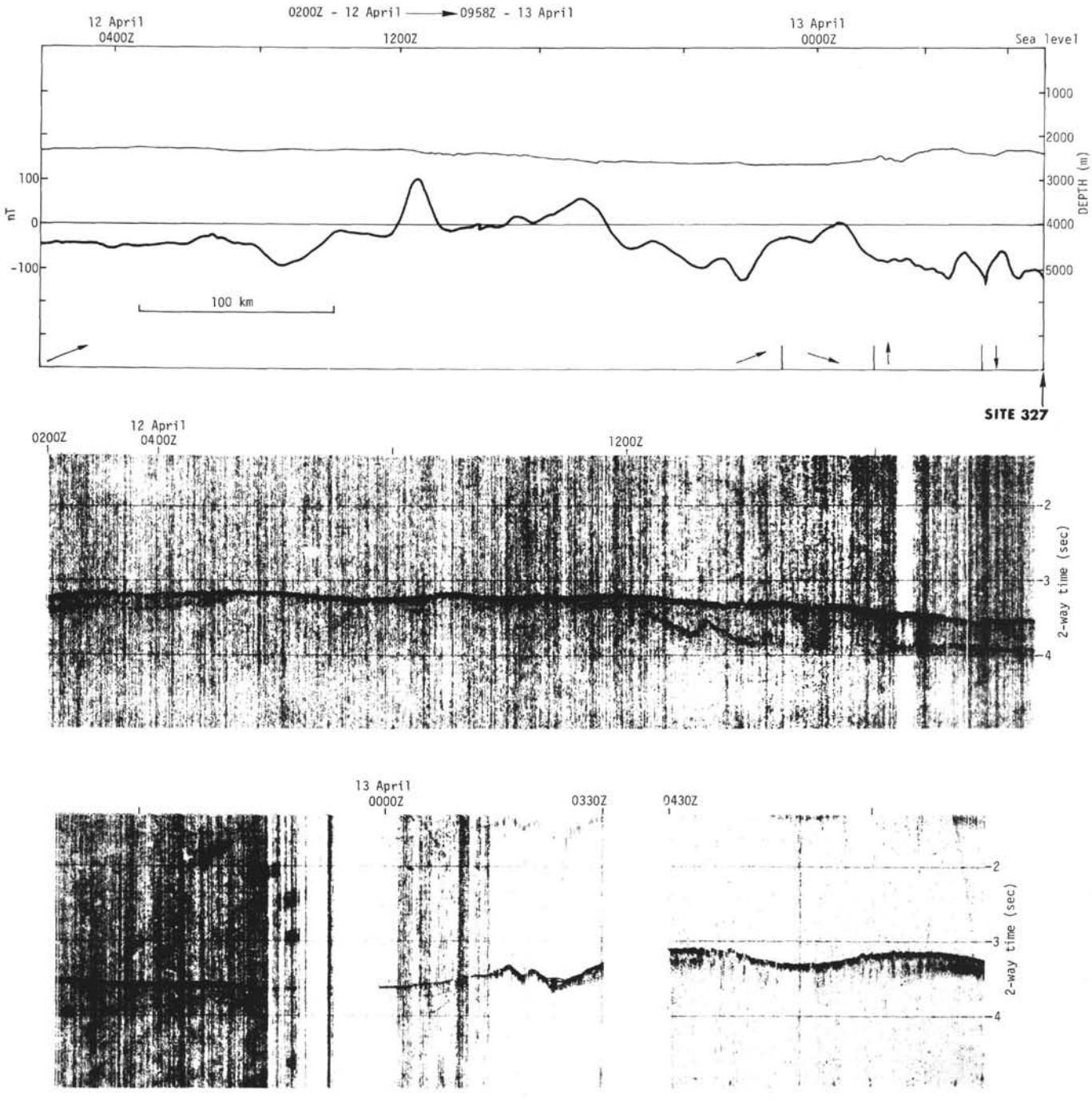

Figure 5. *0200 12 to 0958 13 April.*

be sampled. The reflection profile of Figure 2 shows discrete pods of sediment up to 0.5 sec TW thick, deposited under the influence of strong bottom currents. These currents combined with a strong westerly gale to part the drill pipe at Site 326 and thus to abort the hole. During the return journey to sheltered water at Bahia Aguirre, at the eastern end of the Beagle Channel, the underway gear was not streamed because of bad weather.

The next section of track, starting on 10 April after release from detention by the Argentine authorities in Bahia Aguirre, skirted the southern margin of Burdwood Bank before heading along 070° approximately, for Site 327 on the eastern Falkland Plateau. This course took the ship obliquely across Burdwood Bank, nonmagnetic and acoustically opaque (Figure 3), down its stepped northeastern side (Figure 4), where small pockets of sediments were seen, and across the Falkland Trough onto the Falkland Plateau. The trough extends from southwest of the Falkland Islands where it is at continental shelf depths, almost as far eastward as South Georgia, between the Falkland Plateau and the north Scotia Ridge, deepening eastward to 3000 meters by 55°W and lying below that

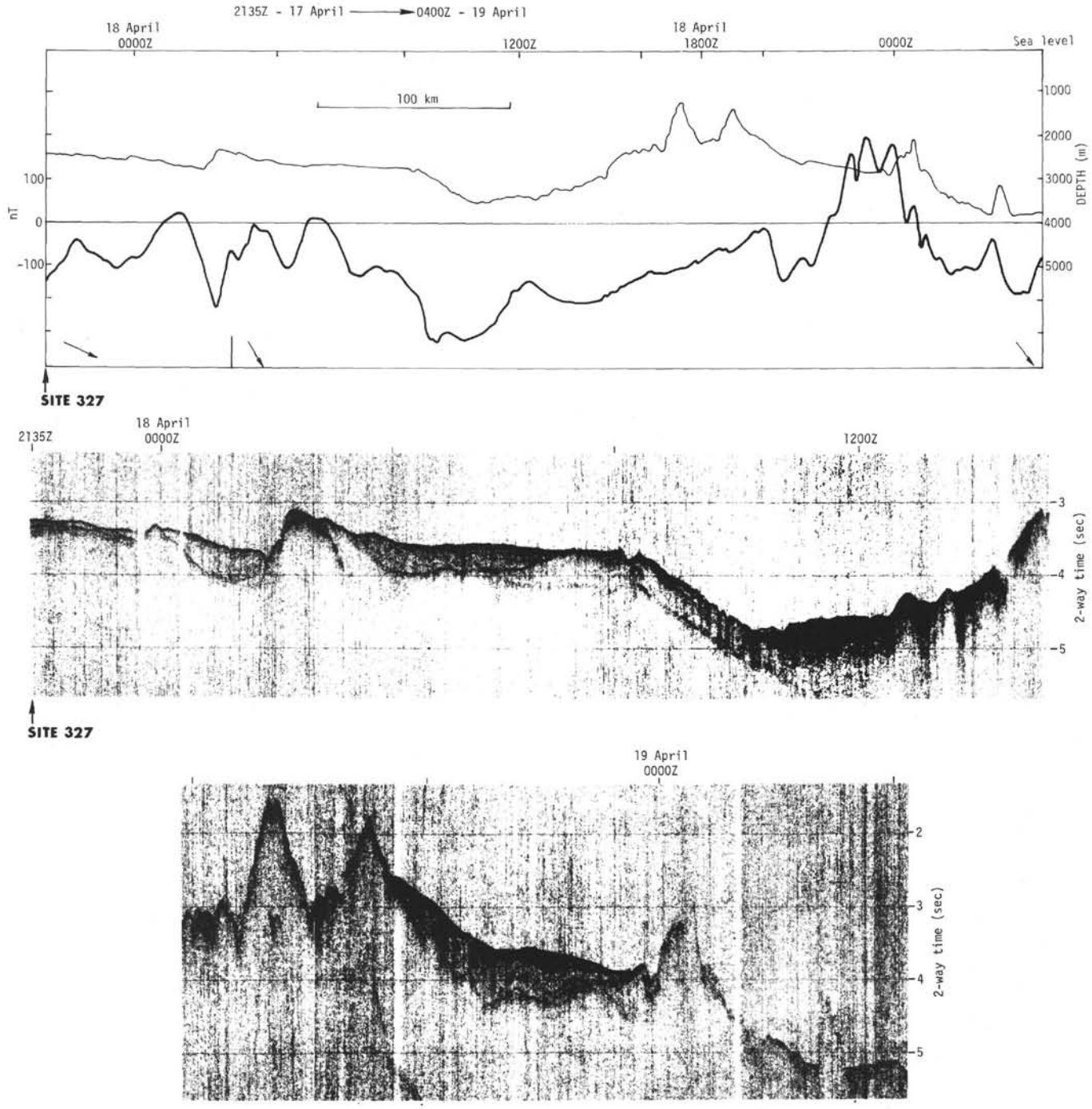

Figure 6. *2135 17 to 0400 19 April.*

depth to its eastern end at about 42°W. Its tectonic significance, obviously great, is unknown as yet; it has been suggested variously as of compressional, strike-slip and extensional origin. It is an important path also for water traveling eastward from Drake Passage; shallow water can cross Burdwood Bank and the western north Scotia Ridge and at 49°W there is a deep channel through the north ridge, through which colder deep water and the Antarctic Convergence passes at present. Other reflection profiles (J. Burrell, personal communication) show more than 3 sec TW of sediment beneath the Falkland Trough and the southern part of the plateau, so the penetration of the *Glomar Challenger* profile in Figures 4 and 5 is not to basement. The disposition of sediments is interesting; the uppermost horizon is confined to the trough, and older sediments lie at the sea bed between 0800 and 1230 on 11 April (Figures 4 and 5). This is an example of non-deposition or even submarine erosion under the influence of strong bottom currents which is typical of the Falkland Plateau. Another, similar interface crops out at the sea bed at 2130 on 11 April.

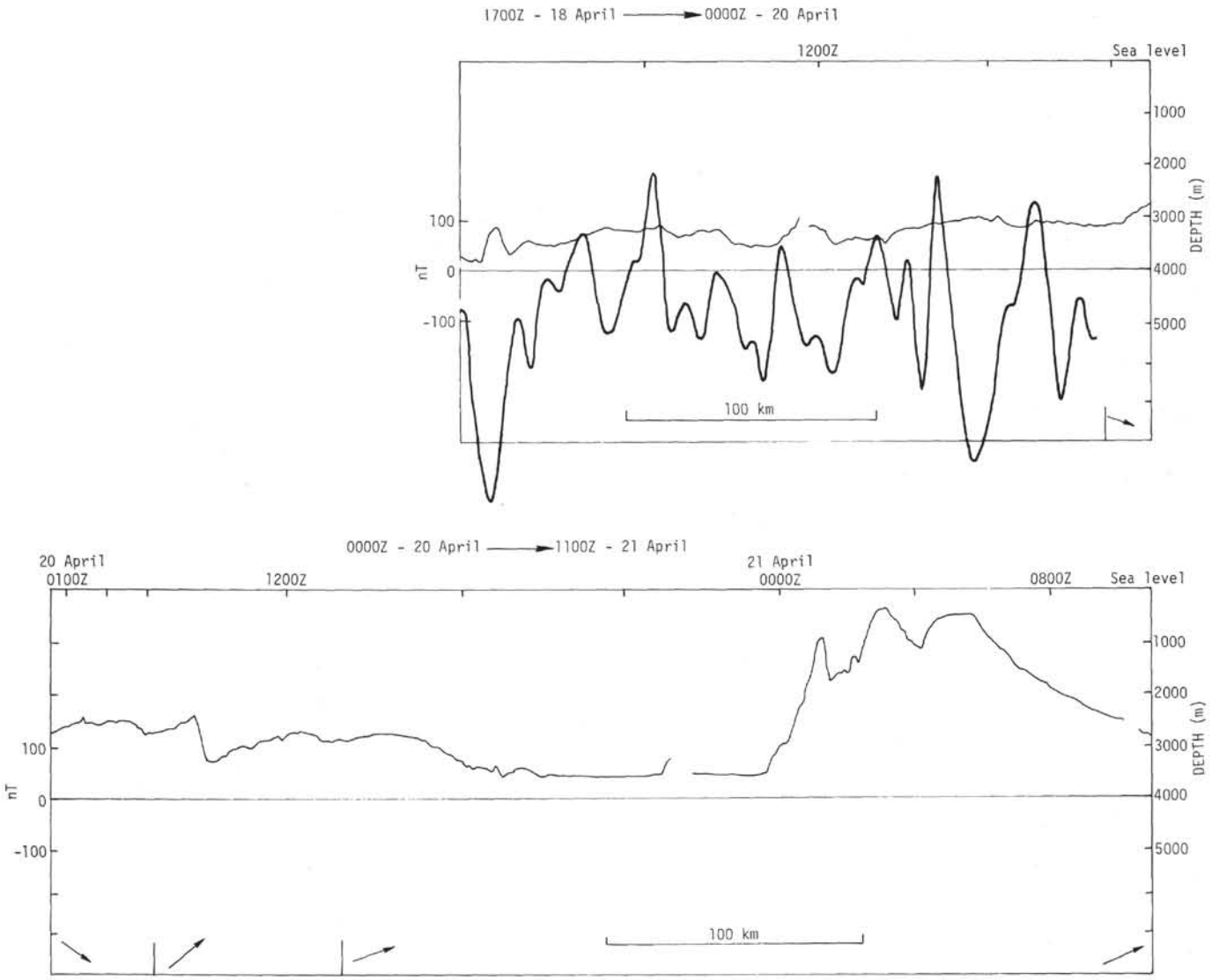

Figure 7. *1700 18 to 1100 21 April (no reflection profile).*

Refraction lines shot elsewhere on the central basin province of the Falkland Plateau demonstrate that it is floored by continental crust (Ewing et al., 1971). The magnetic anomalies observed over the basin province of the plateau are explicable in terms of the known geology of the Falkland Islands, southeastern South America, and southern Africa and do not necessarily indicate an oceanic crustal structure.

A small amount of site survey was undertaken in bad weather at Site 327, involving a short north-south loop with the objective, not achieved, of testing for closure on a deep reflector; penetration close to the site was less than 0.5 sec TW (Figure 5).

After abandoning Site 327 in bad and unpromising weather, course was set for a proposed site south of South Georgia on an anomalously elevated area of otherwise typical ocean floor. The ship headed first along 125° to cross a small elevation on the plateau (at 0230 on 18 April, Figure 6), and then along 150° in steadily worsening weather. Profiler penetration improved to almost 1 sec TW in places at the southern edge of the plateau and across the Falkland Trough, here 3500 meters deep; as on the previous crossing, however, it is unlikely that the base of the sediment pile was reached. It is interesting to note that again, as on the crossing further west, the northern flank of the Falkland Trough is an obvious erosion surface, with younger sediments occurring in the axis of the trough and, in this locality, on the plateau to the north.

The acoustic opacity and near-absence of magnetic material observed on this crossing are typical of the north Scotia Ridge (with the exception of South Georgia). Where component bodies of the ridge are at shallow depth, they are found to be continental fragments, but the nature and origin of this section are uncertain.

The orientation of magnetic anomalies in that part of the eastern Scotia Sea traversed between 0000 and 1900 on 19 April (Figure 7a) is unknown, but should be close to east-west (that is, perpendicular to the track) since the profile contains much short-wavelength energy. Figure 7 is made up of two magnetic and bathymetric

profiles. The reflection profile is entirely without penetration in the very bad weather and is not shown; indeed, the weather became so bad that the towed equipment was recovered lest it foul the ship's propellors. It was in this weather, with worse forecast and in the presence of icebergs, that the decision was taken to abandon first the intended hole south of South Georgia and then a second lying some distance east of the South Sandwich Islands, in favor of heading for more northerly sites where better weather and fewer icebergs could be expected. It should be mentioned at this stage that these two sites had been moved to positions outside a 200 n.mi. radius of South Georgia and the South Sandwich Islands, to avoid the possibility of further conflict with Argentina, which claims the islands. Two other sites, which by their nature could not be relocated, had been abandoned for the same reason.

The towed gear was restreamed at 1100 on 21 April for a crossing of the western end of the South Sandwich trench, after skirting the eastern continental shelf of South Georgia, but was recovered shortly afterwards because of the presence of icebergs. It was streamed again during daylight hours on 22 April (Figure 8) and at 1130 on 23 April for the final approach to Site 328 (Figure 9). Since this site had been relocated too, a small amount of site survey was necessary, occupying the last 5 hr before the beacon drop. The object of the site survey was to see if an area on the flank of a small basin, where a deep reflector it was intended to sample lay closer to the sea bed, was sufficiently extensive to be representative of the ocean floor in general. The reflector in question can be seen at about 0.68 sec at the site, in Figure 9. In the end, a combination of bad weather and the close approach of an iceberg to the site prevented the hole from reaching it.

The ship headed west on abandoning the site, for a second site on the eastern Falkland Plateau close to Site 327, but was forced northward by high concentrations of icebergs on the direct track. Reflection profiler penetration here is the deepest of the leg, 1.4 sec TW to a reflector which is either the oceanic basaltic layer or the postulated equivalent of Horizon "B" of the Argentine Basin (Ewing and Lonardi, 1971). The fine banding in the uppermost 0.05 sec of the record at Site 328, representing Neogene siliceous ooze, thickens west-

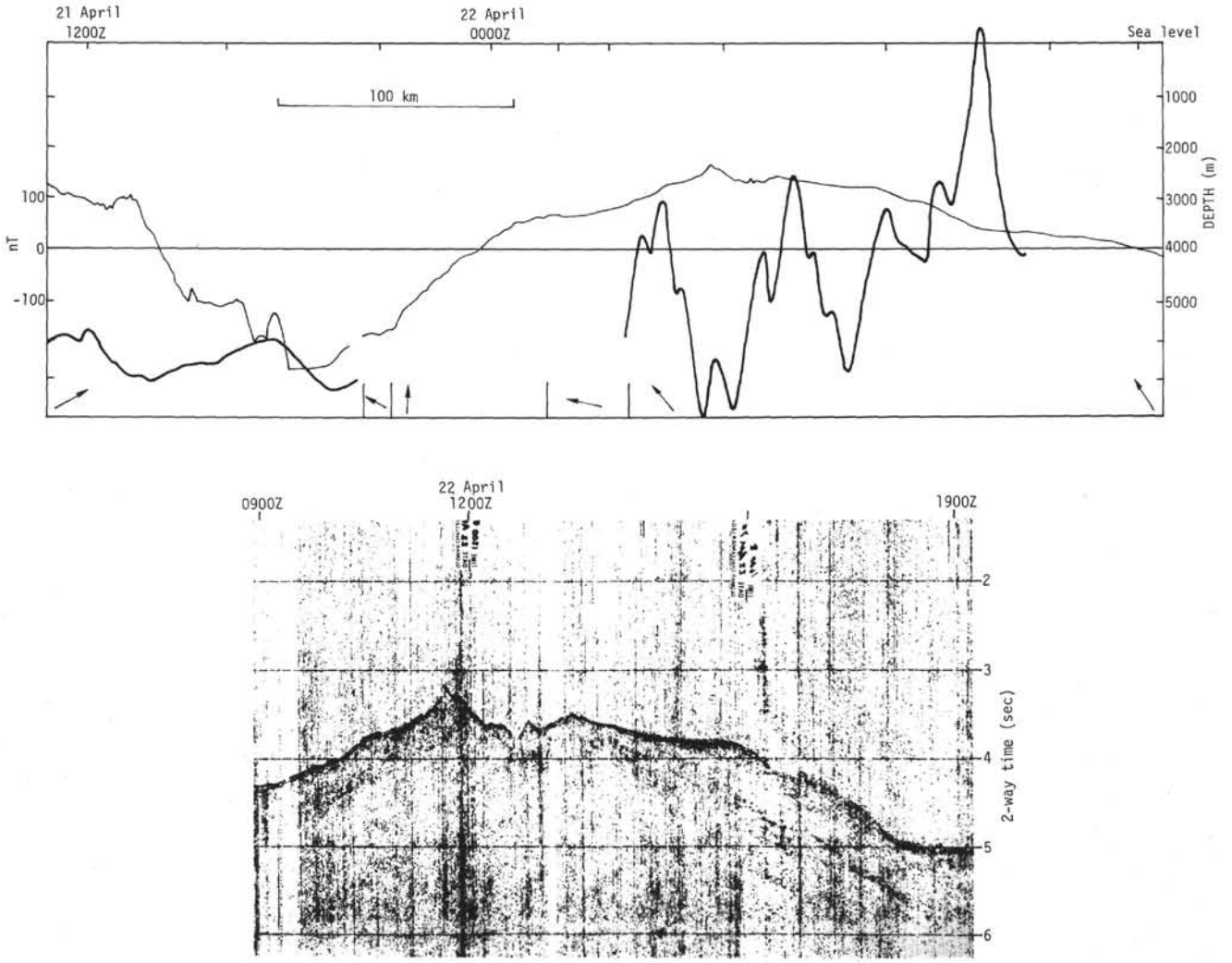

Figure 8. *1100 21 to 0100 23 April.*

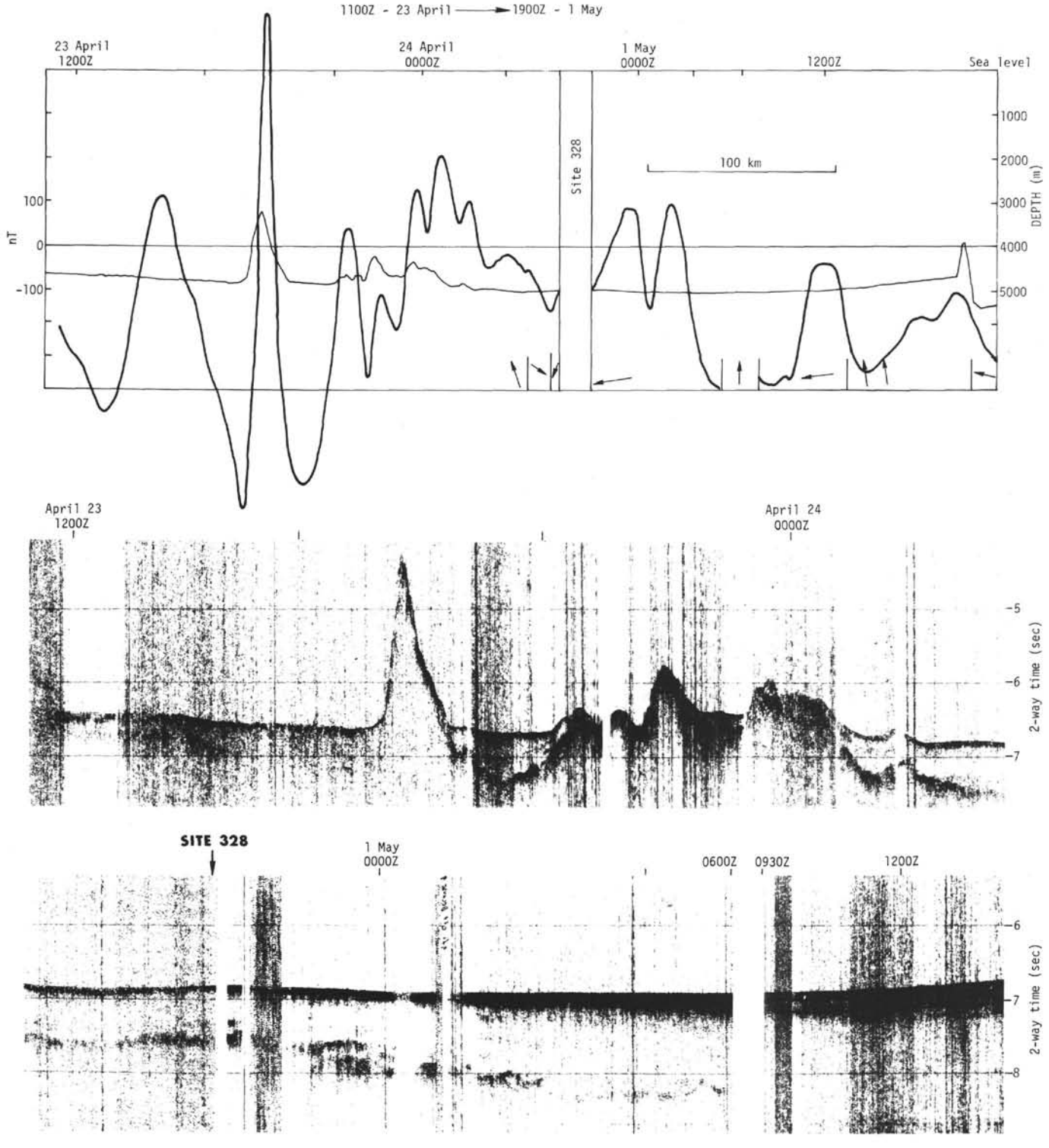

Figure 9. *1100 23 April to 1900 1 May.*

ward to nearly 0.5 sec in places on this track (for example, near 1300 on 1 May, Figure 9), and to more than 2 sec farther south (University of Birmingham, unpublished reflection profiles). The Malvinas Outer Basin, south of the Falkland Fracture Zone and east of the Falkland Plateau, is floored by oceanic crust of unknown age. Since the Falkland Plateau very probably has remained rigidly attached to South America since their separation from Africa, this area could be of the same age as the southern Argentine Basin at the same distance east of the South American margin. It would have spread away from the vicinity of the Mozambique Ridge, which would itself have been similarly a foundered part of the African margin. However, the continuation of such a simple scheme of symmetric spreading would have preserved to the present day an

offset in the Mid-Atlantic Ridge crest across the Falkland Fracture Zone at least as great as the length of the plateau. That this has not happened implies a westward jump in the position of the ridge crest or a period of strongly asymmetric spreading, south of the Fracture Zone in the last 127 m.y., or a flaw in the set of initial assumptions outlined above. For example, the Mozambique Ridge and Africa may not have remained attached, or sea floor south of the fracture zone may have been formed in the wake of Antarctica rather than Africa.

If the eastern margin of the Falkland Plateau did form 127 m.y. ago, the region around Site 328 would lie within the sequence of Mesozoic magnetic anomalies, found by Larson and Ladd (1973) in the Cape Basin. If, on the other hand, the Mid-Atlantic Ridge did not extend south from the Falkland Fracture Zone until the ridge crest was opposite the present eastern margin of the plateau, or jumped westward at that time (a relatively simple way of eliminating the offset), then the site would be in the vicinity of anomaly 33. The *Glomar Challenger* profiles alone are insufficient to distinguish

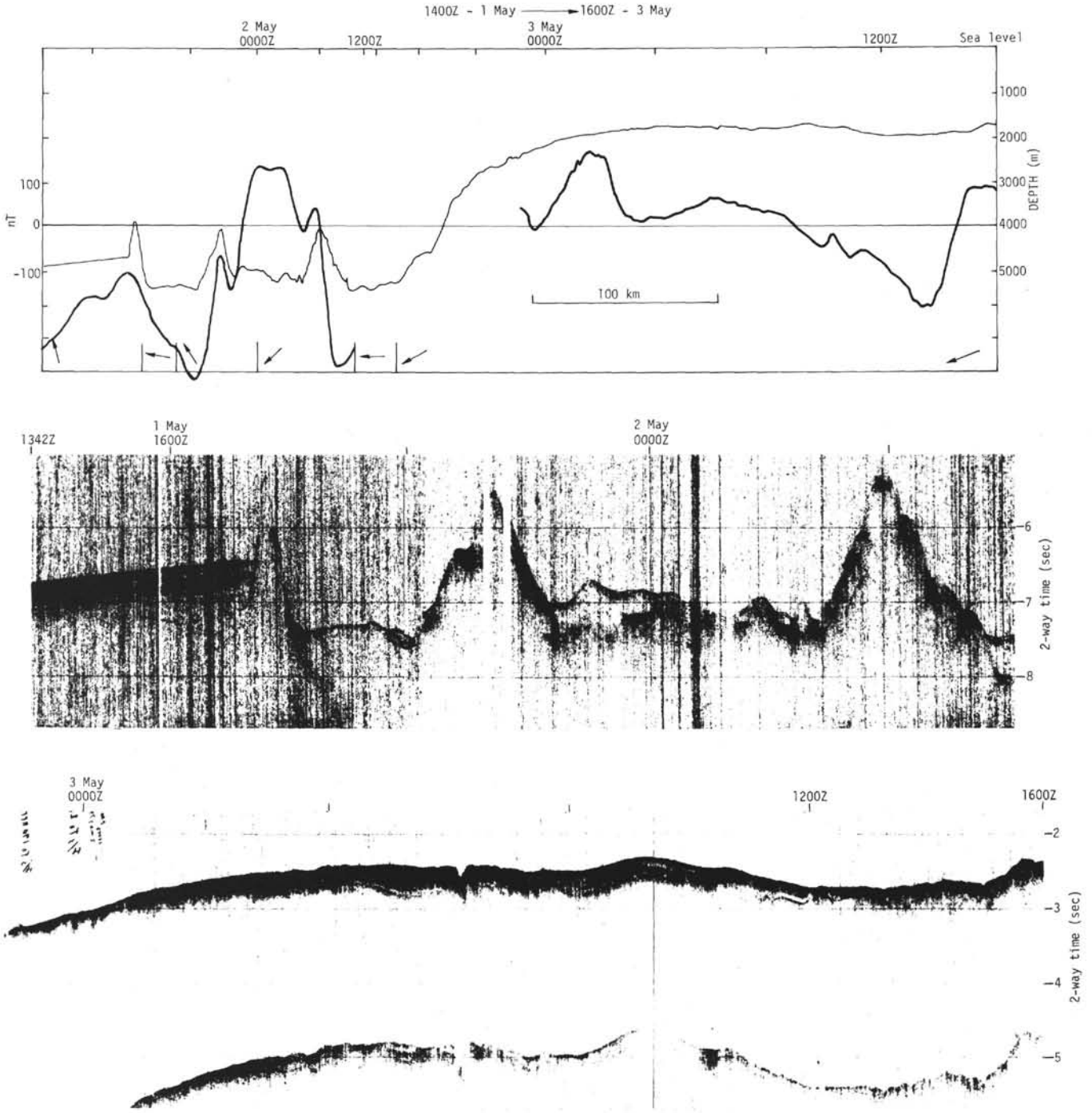

Figure 10. *1400 1 to 1600 3 May.*

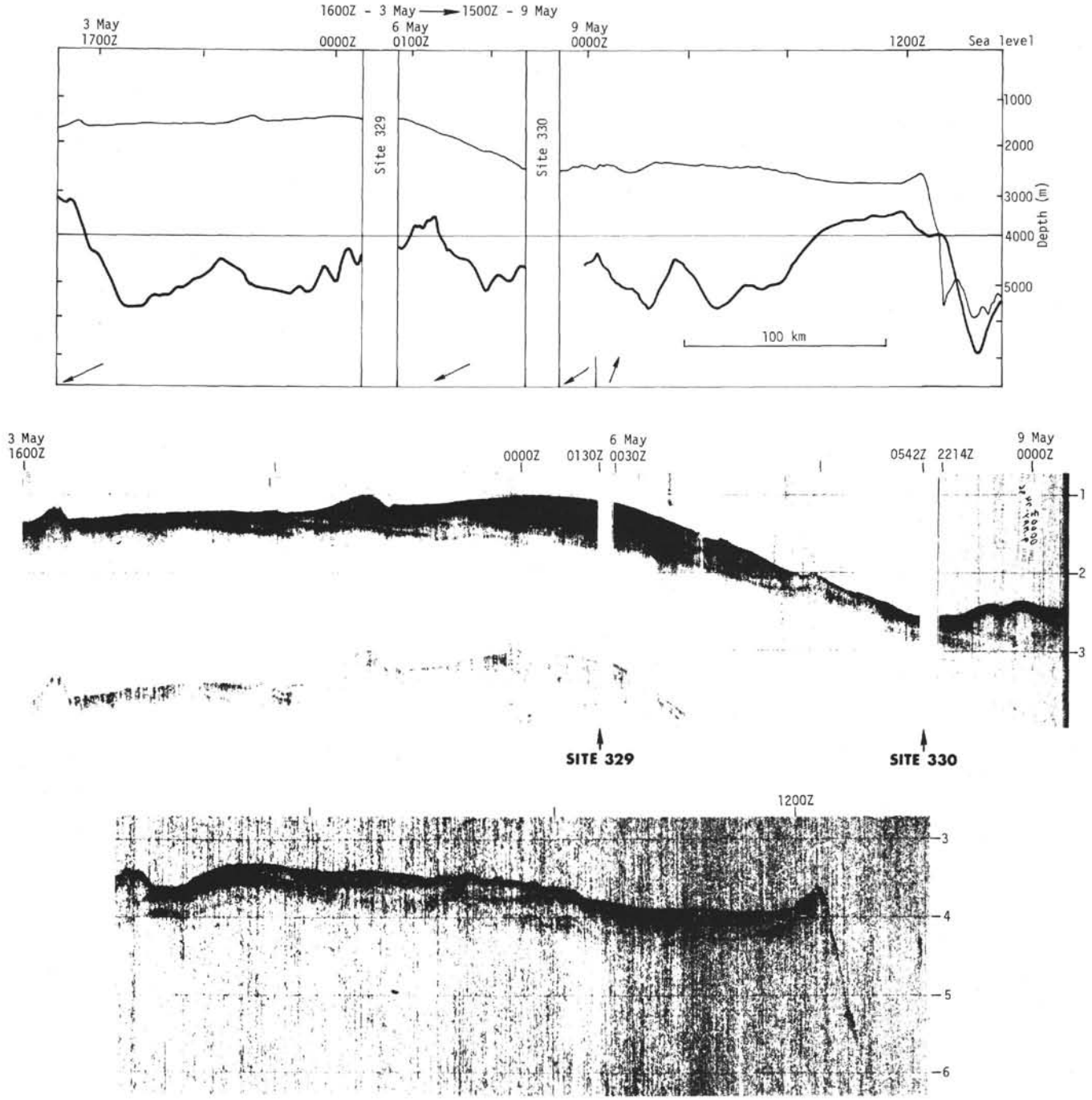

Figure 11. *1600 3 to 1500 9 May.*

between these two possibilities, or to eliminate other, more complex explanations.

The ship remained north of the Falkland Fracture Zone only for long enough to find a path through the field of icebergs, and had moved southwest onto the northeastern flank of the Maurice Ewing Bank (Figure 10) by 2000 on 2 May. The track between there and the position at 0030 on 9 May, which includes Sites 329 and 330 and passes within 2 km of Site 327 is virtually a straight line along 250°. That section of the reflection profile (4 sec sweep) acquired between 2000 on 3 May and 0030 on 9 May is considered in great detail elsewhere in this volume in the interests of correlating between the three sites (Barker, this volume).

The reflection profile across the bank (Figures 10 and 11) shows up to 0.6 sec penetration into sediments which, at least close to the drill sites, are known to be considerably thicker. It is possible, but by no means certain, that the rough elevation encountered between 1500 and 1645 on 3 May is a true acoustic basement, but otherwise the presence of other sediments below those shown on the reflection profiles is most prob-

able. The sediments are not ponded, but appear draped over older undulations, or as local banks separated by areas of nondeposition. In all this they resemble the Maestrichtian to late Miocene biogenic oozes cored at the sites. The lithologies of these sediments and their distribution close to the sites indicate deposition generally above the CCD under a regime of bottom currents of increasing strength, a history which therefore probably applies to the entire eastern elevated part of the plateau.

Magnetic anomalies of nearly 300 nT amplitude occur along this profile, the largest apparently being associated with the rough elevation mentioned above; at least some of the anomalies are of such short wavelength that they must result from magnetic contrasts lying directly beneath the sediments. These would be greatly attenuated by a further 2 to 3 km subsidence but, as discussed earlier, sufficient longer wavelength energy would remain to give rise to the anomalies observed over the central "Basin Province" of the plateau, without having to invoke the presence of oceanic crust.

Shortly after leaving Site 330, *Glomar Challenger* altered course northward for Site 331 in the Argentine Basin. The first 170 km, across the plateau to the

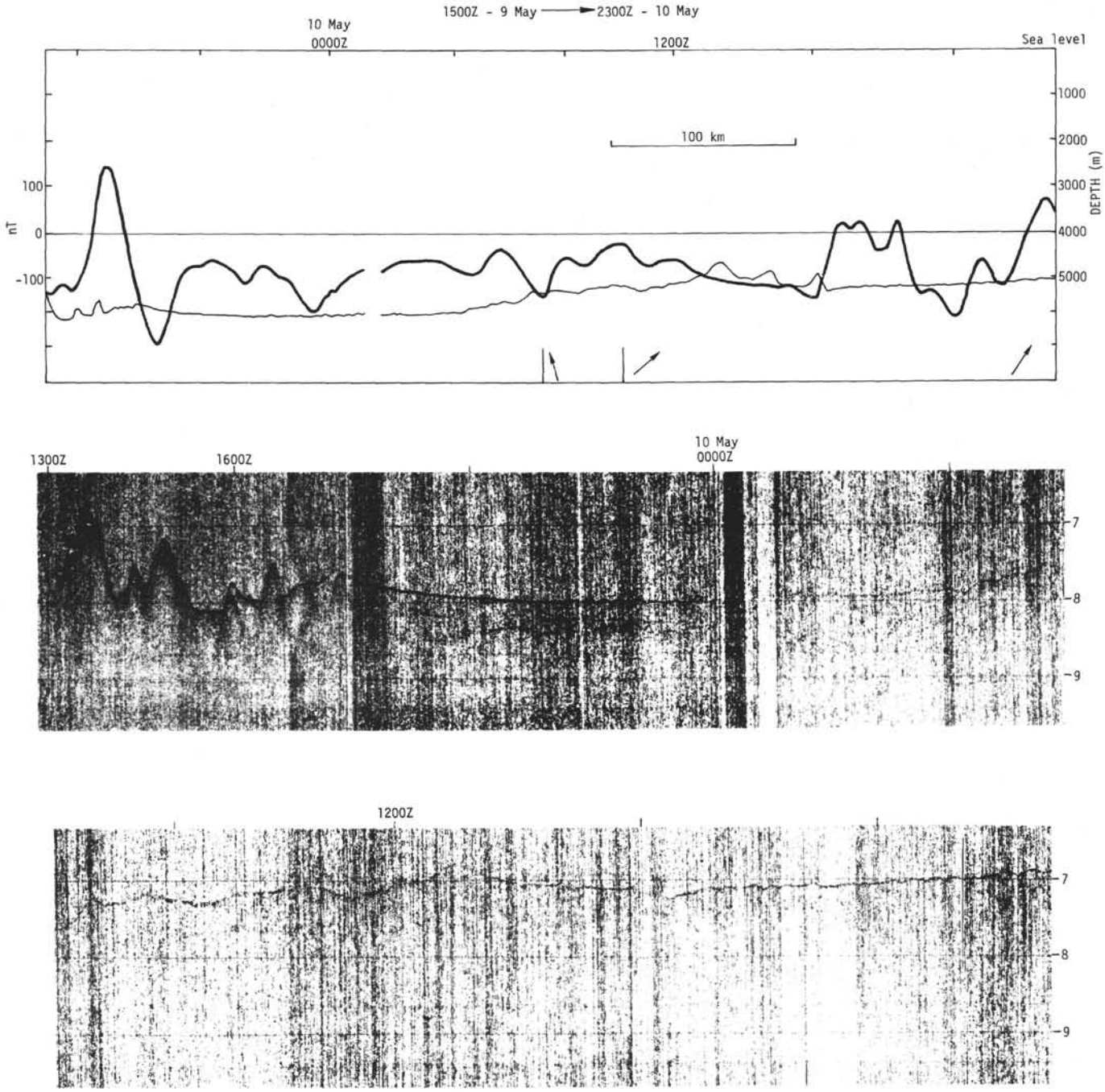

Figure 12. *1500 9 to 2300 10 May.*

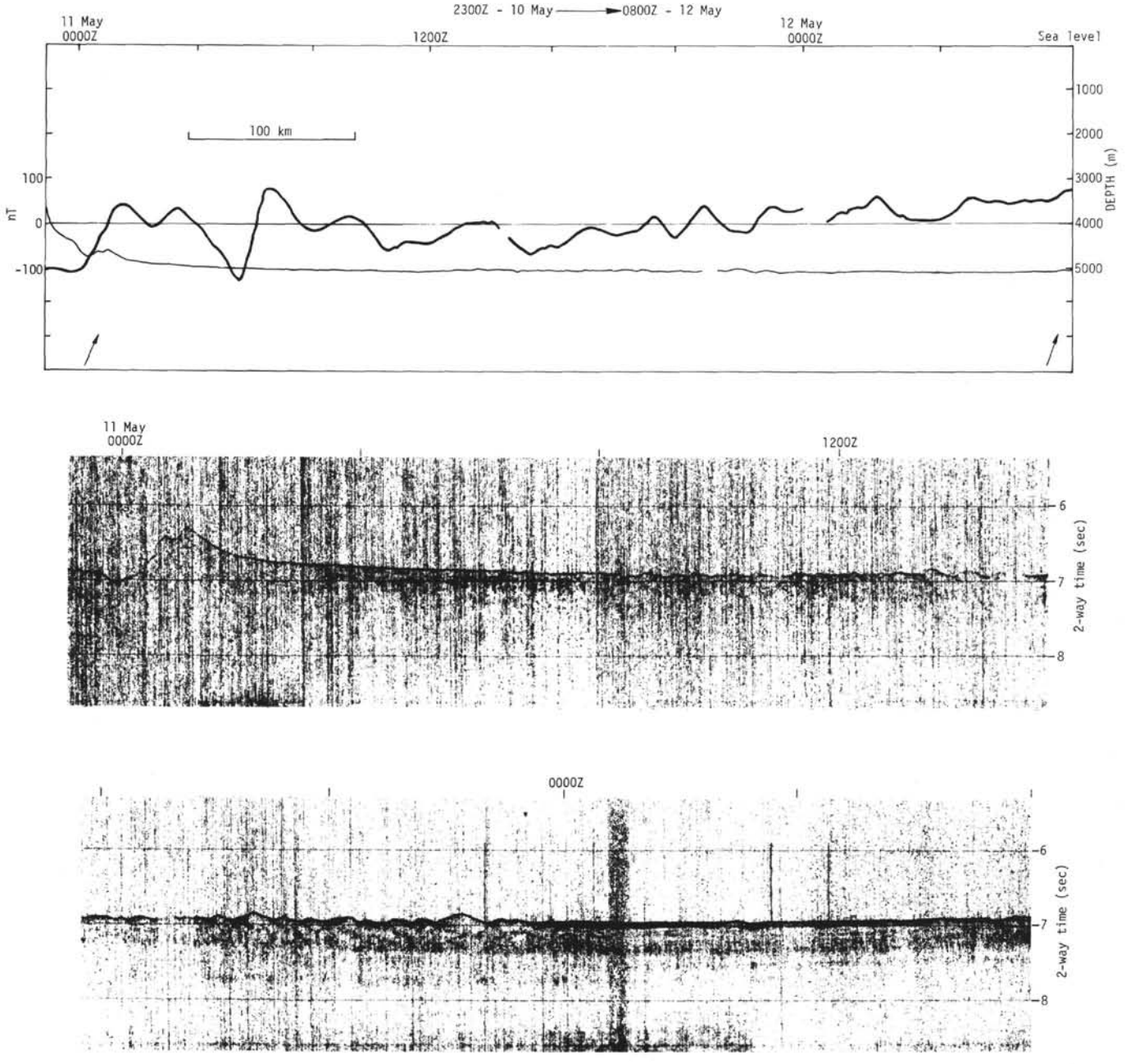

Figure 13. *2300 10 to 0800 12 May.*

Falkland Escarpment, (Figure 11, 1300 on 9 May) is similar in character to the section considered directly above, with the uppermost sediments pinching out at the northern edge.

The sedimentary and magnetic characteristics of the Argentine Basin are relatively well known (Ewing et al., 1971; Ewing and Lonardi, 1971; Ladd et al., 1973; Larson and Ladd, 1973), and the increasingly bad weather so limited reflection profiler penetration that the records displayed here do not contribute significantly to our understanding of the region. The "giant ripple marks" are seen and the track crosses the Zapiola Ridge. Typical lineated oceanic magnetic anomalies in this part of the Argentine Basin, if they occur, should strike at between 005° and 010°, making an angle of only 15° to 20° with the ship's track. However, most of the track to Site 331 lies apparently in the quiet zone beyond anomaly 34, in which no obvious lineations have been found. Thus the anomalies along the profile should result from a combination of field intensity and petrologic variations, oblique crossings of such lineated anomalies as do occur, and fracture zone anomalies. The profile is consistent with these assumptions; for example, the anomaly at 1600 on 10 May (Figure 12) could be associated with a fracture zone, and that at 1600 on 12 May (Figure 14) is probably anomaly 34.

The same factors apply over the first 200 km of track beyond Site 331, which is headed due north for a potential site in the Vema Channel, between the Argentine and Brazil basins (Le Pichon et al., 1971). After 0200 on

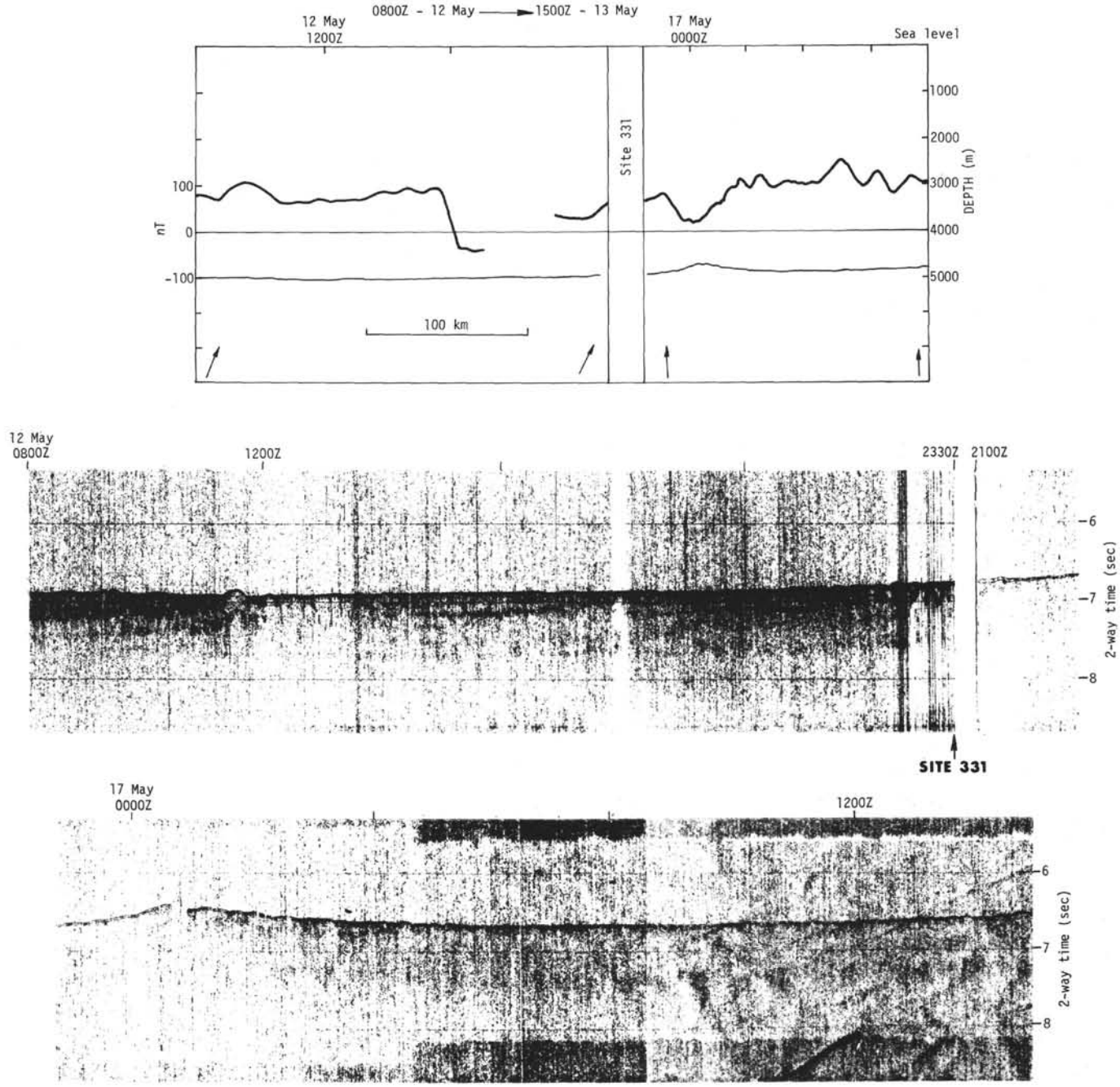

Figure 14. *0800 12 to 1500 17 May.*

18 May, however, the character of the sea bed changes. Seemingly as a result of crossing the western flank of the eastern part of the Rio Grande Rise, the bathymetric, seismic, and magnetic profiles all become much more disturbed. A suitable position for the prospective site was crossed at about 0345; on 20 May the towed gear was recovered and a beacon laid, but a fault in a reference gyro of the automatic positioning system prevented any further progress towards drilling a hole to examine the history of the flow of Antarctic Bottom Water through the channel. The ship headed northwestward, directly towards Rio de Janeiro, crossing two strongly magnetized seamounts en route and completing underway measurements at 0230 on 22 May 1974, near the top of the continental slope and about 150 km from Rio de Janeiro.

ACKNOWLEDGMENTS

The underway data were collected at sea by the Scripps technical staff under the supervision of Mike Lehman, in weather conditions considerably worse than usual. Editing of Leg 36 navigational data, also more onerous than usual because of a shipboard computer breakdown at Site 331, was done by Mike Lehman and Uta Albright. Punched cards containing the navigational, bathymetric, and magnetic data and

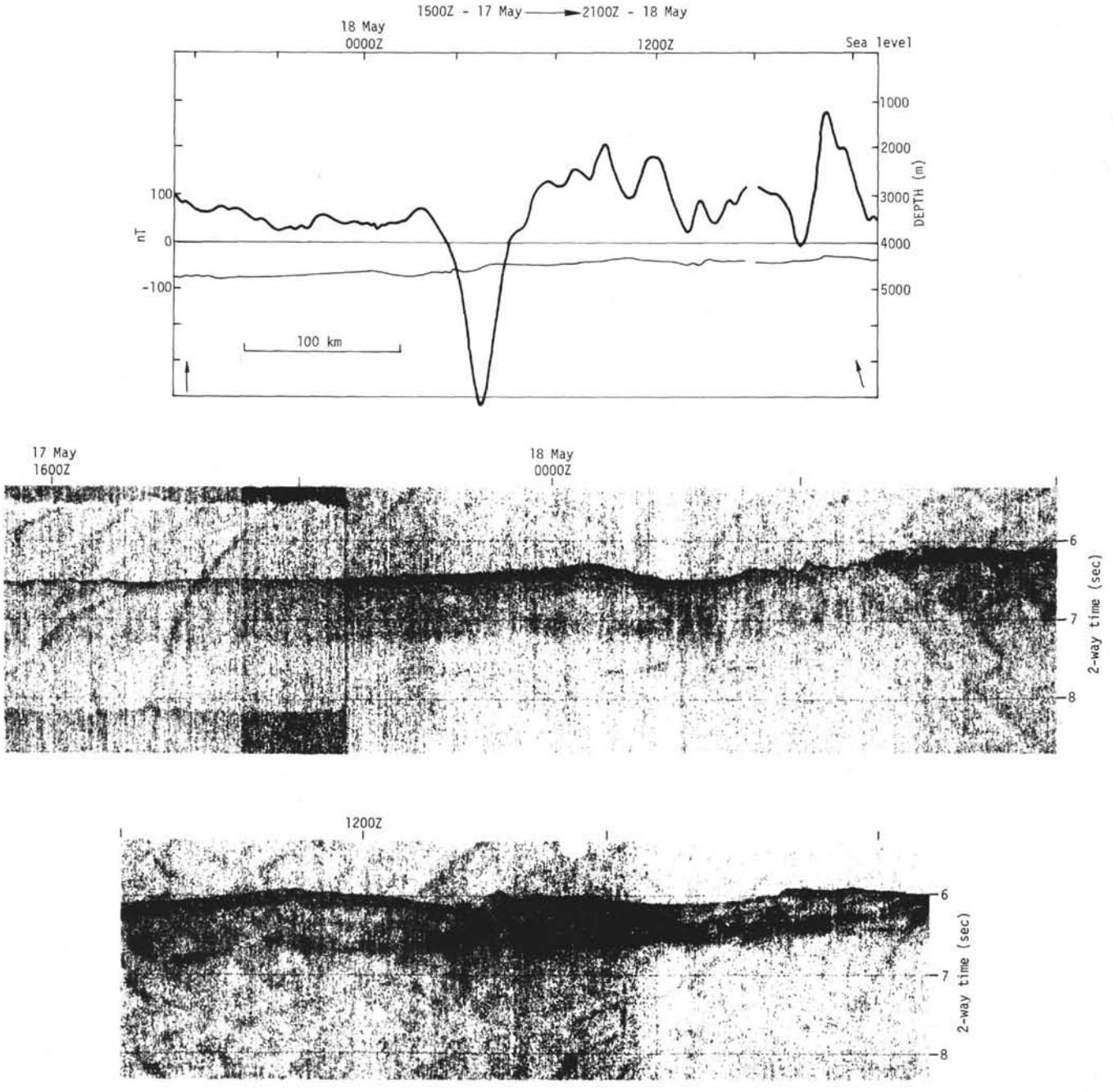

Figure 15 *1500 17 to 2100 18 May.*

microfilm of the reflection profiles were provided by Barbara Long and the Underway Data Processing Group. I would like to thank all of the people mentioned above, and also the Global Marine shipboard staff, headed by Captain Lloyd Dill and Cotton Guess, and the Operations Manager, Otis Moore, for helping to provide the data displayed and considered above.

REFERENCES

Barker, P.F., 1970. Plate tectonics of the Scotia Sea region: Nature, v. 228, p. 1293-1296.

Ewing, J.I., Ludwig, W.J., Ewing, M., and Eittreim, S.L., 1971. Structure of the Scotia Sea and Falkland Plateau: J. Geophys. Res., v. 76, p. 7118-7137.

Ewing, M. and Lonardi, A.G., 1971. Sediment transport and distribution in the Argentine Margin, basin and related provinces: Phys. Chem. Earth, v. 8, p. 79-122.

IAGA Commission 2 W G 4, 1969. International Geomagnetic Reference Field 1965.0: J. Geophys. Res., v. 74, p. 4407.

Ladd, J.W., Dickson, G.O., and Pitman, W.C., 1973. The age of the South Atlantic. *In* Nairn, A.E.M. and Stehli, F.G. (Eds.), The ocean basins and margins: New York (Plenum Press), v. 1, p. 555-574.

Larson, R.L. and Ladd, J.W., 1973. Evidence for the opening of the South Atlantic in the Early Cretaceous: Nature, v. 246, p. 209-212.

Le Pichon, A., Ewing, M., and Truchan, M., 1971. Sediment transport and distribution in the Argentine Basin. 2. Antarctic Bottom Current passage into the Brazil Basin: Phys. Chem. Earth, v. 8, p. 29-48.

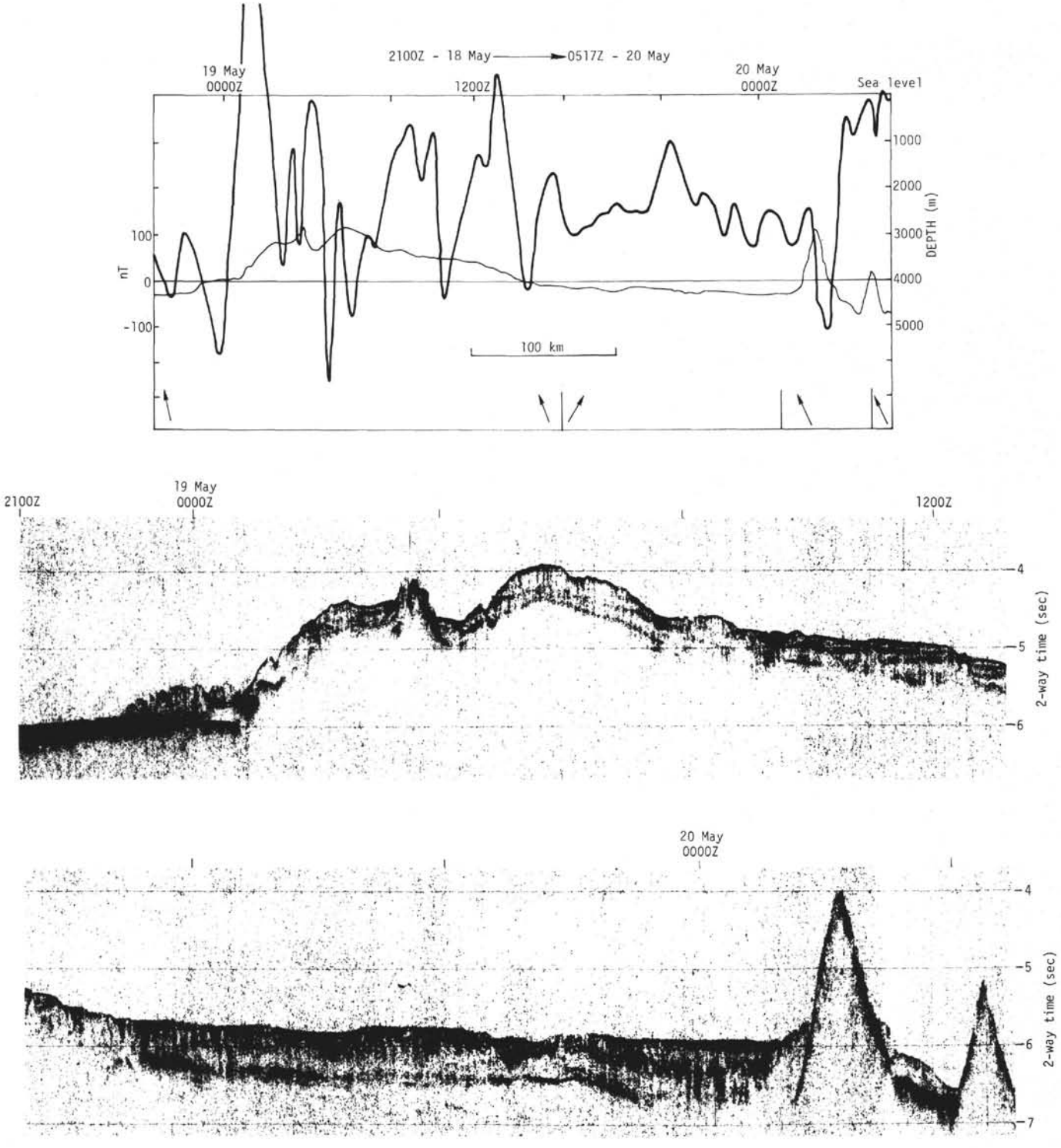

Figure 16. *2100 18 to 0517 20 May.*

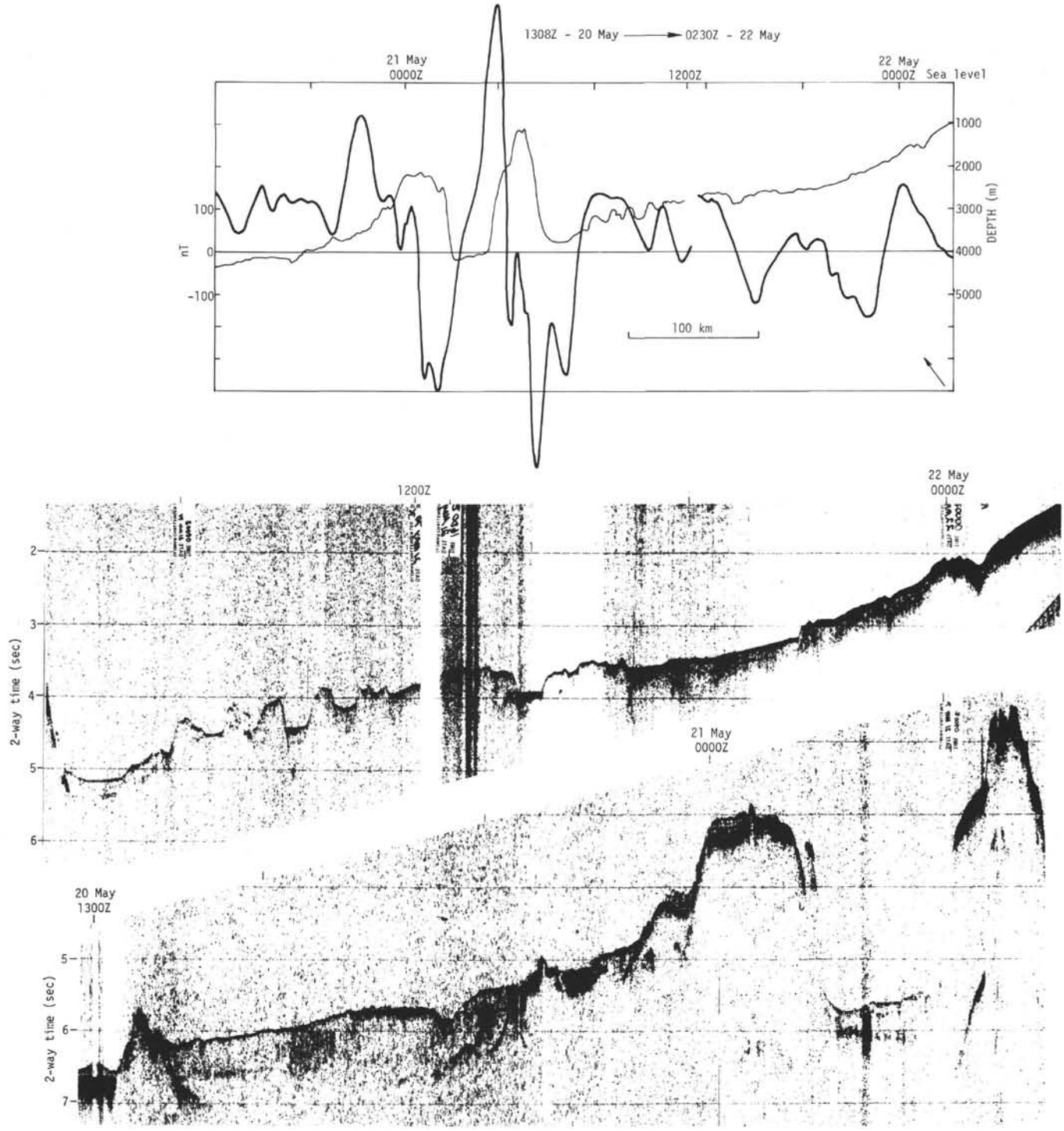

Figure 17. *1308 20 to 0230 22 May.*